

SONY®

PORTABLE VIDEOCASSETTE RECORDER
BVW-35P



BETACAM SP™

OPERATION MANUAL
2nd Edition (Revised 1)
Serial No. 10425 and Higher
EBU N-10 LEVEL

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OUTLINE

The BVW-35P is a "Betacam SP" (Superior Performance) series video cassette recorder for portable use. It can be used with a "Betacam" series video camera such as a BVP-5P, and also with a conventional video camera such as a BVP-330AP. The recorded material can be transmitted by an FPU (Field Pickup Unit).

"Betacam SP" format recording/playback

Improved video characteristics using metal tape

The "Betacam SP" format uses the metal tape with high quality electrical characteristics and a newly developed video head. So consequently, the signal-to-noise ratio, frequency characteristics, waveform characteristics, detail reproduction, etc. will be extremely improved when compared with the conventional "Betacam" format.

4-channel audio recording/playback and high-quality sound

When metal tape is used, 2 channels of frequency modulated sound (AFM) can be recorded on a chrominance track with frequency multiplexed in addition to the conventional 2-channel audio recording on the longitudinal tracks (LNG). With the AFM recording, a wide dynamic range can be obtained, which makes possible high quality sound even under difficult recording conditions.

The conventional recording on the longitudinal tracks with metal tape improves the frequency characteristics and reduces distortion.

Compatibility with the conventional "Betacam" format VTR

The BVW-35P automatically distinguishes the type of cassette tape, and performs the recording and playback with the appropriate format. Oxide cassette tapes recorded on the BVW-35P can be played back on conventional "Betacam" format VTRs, and also cassettes recorded on a conventional VTR can be played back on the BVW-35P. Metal cassette tapes recorded on the BVW-35P can be played back on conventional "Betacam" format VTRs which has been modified a little.



Dolby NR system

The BVW-35P employs the C-type Dolby NR* system for audio tape noise reduction. When metal tape is used, the audio signal is recorded using the Dolby NR system. When oxide tape is used, you can turn the Dolby NR system on or off.

Video and audio simultaneous playback function

During recording, the luminance or chrominance signal can be simultaneously played back for monitoring. The audio signals recorded on channels 1 and 2 longitudinally can also be monitored.

Time code generator/reader

A time code generator/reader which can generate and read both LTC (Longitudinal Time Code) and VITC (Vertical Interval Time Code) is built-in. The VITC can be recorded and played back together with the LTC when recording the video and audio signals. The user bits can also be recorded and played back, and furthermore the time of the day (real time) can be set as a part of the user bits.

Slave lock of time code

The built-in time code generator can be locked with an external time code generator. Besides the time code, user bits can also be locked with external user bits.

Protection against accidental interruption of recording

All function buttons other than the STOP and PAUSE buttons are disabled during recording so that the recording will not be interrupted accidentally. When the KEY INHIBIT switch is set to ON, all function buttons including STOP and PAUSE buttons will be disabled in any mode including the record mode.

Warning system

The WARNING lamp and one of the warning indications light or blink to tell the operator at a glance the condition of the unit, for example, the end of tape, slack tape, low battery charge, head clog, etc. An audible alarm will sound simultaneously through the earphone and the headphones.

Smooth transition of scenes

Quick servo system allows smooth transition from scene to scene in the pause mode. It is also possible to record scenes with smooth transition in the VTR SAVE mode of the camera or the stop mode. If the cassette is ejected and inserted again, the recording will be made by overlapping with the scene previously recorded by about 0.1 second so that the scenes can be connected smoothly in this case also.

* Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.

"DOLBY" and the double-D symbol  are trademarks of Dolby Laboratories Licensing Corporation.

Search function

Forward and reverse playback picture (black and white) at about 3 times normal speed can be monitored.

Connection with a time base corrector

The BVW-35P can be connected to a Sony BVT series time base corrector.

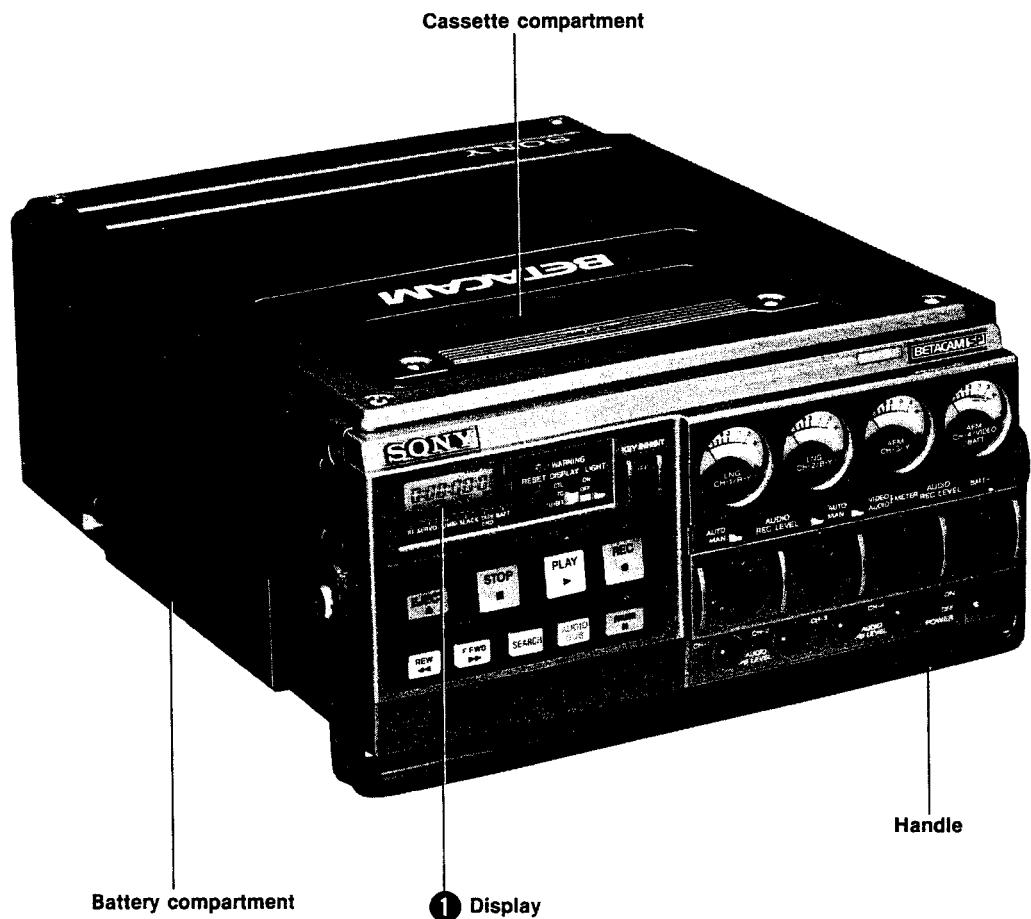
Remote control

A 9-pin REMOTE connector is equipped. The "Betacam" or "Betacam SP" series VTR such as BVW-75P or a BVE series editing control unit such as BVE-900 which is equipped with a 9-pin connector can be connected to control the BVW-35P.

LOCATION AND FUNCTION OF PARTS AND CONTROLS



Control Panel



5 LIGHT selector

Selects the illumination of the display window, level meters and function lamps.

ON: The display window and the level meters are illuminated.

OFF: The lights go out.

BRT: The lights go out, and the brightness of the function lamps is increased. Use this position when the unit is used in a very bright location.

6 KEY INHIBIT switch

ON: All the buttons on the control panel will be deactivated so that the operation will not be interrupted by accidentally pressing a button.

OFF: All the buttons on the control panel will normally function in the mode other than record. During recording, only the STOP and PAUSE buttons function.

7 AUDIO REC LEVEL AUTO/MAN (audio recording level automatic/manual) selectors

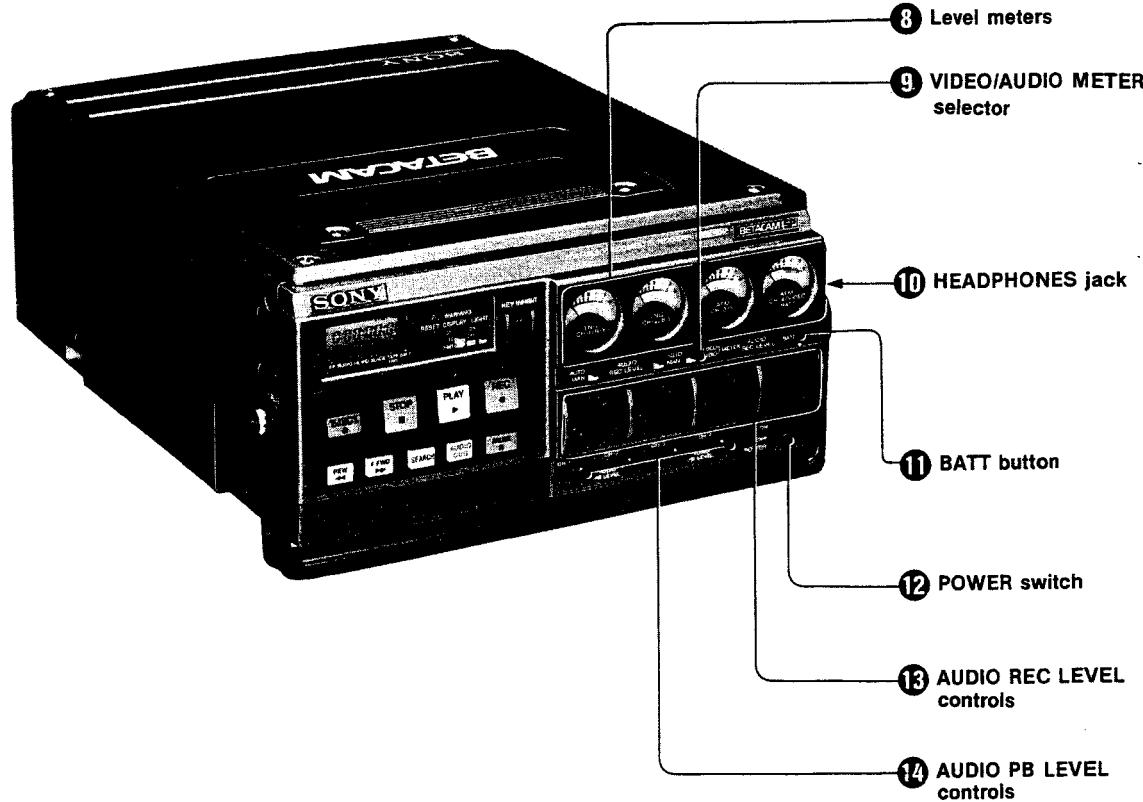
Selects whether the audio recording level on audio channels 1 and 2 is adjusted automatically or manually.

AUTO: To adjust the audio recording level automatically.

MAN: To adjust the audio recording level manually.

- When the level is manually adjusted, the audio limiter circuitry will be activated to minimize audio distortion at the peaks.

- The level recorded on the audio channels 3 and 4 cannot be adjusted automatically.



8 Level meters

The signal level selected by the VIDEO/AUDIO METER selector is shown. (Refer to the table below.)

The right-most AFM/CH-4/VIDEO/BATT meter shows the battery voltage while the BATT button is being pressed.

Operating mode	Setting of VIDEO/AUDIO METER selector	Level meters			
		CH-1/R-Y	CH-2/B-Y	CH-3/Y	CH-4/VIDEO/BATT
Record	AUDIO	CH-1	CH-2	CH-3	CH-4
	VIDEO	R-Y*	B-Y*	Y*	VIDEO**
Playback	AUDIO	CH-1	CH-2	CH-3	CH-4
	VIDEO	—	—	—	—

* The pointer swings only when the component signal is input. The pointers of the CH-1/R-Y and CH-2/B-Y meters fully swing when the 75% color bar signals are input. The signal level higher than that cannot be shown on the meters.

** The pointer swings according to the sync signal level of the component or composite video signal.

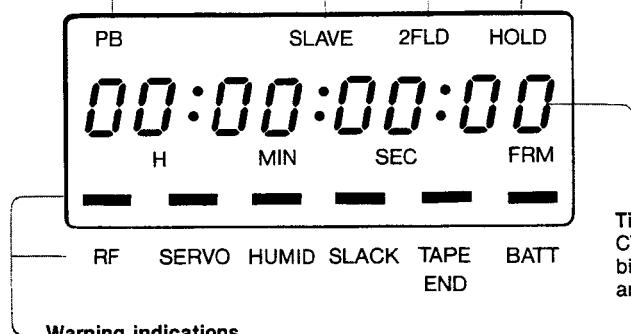
1 Display

Lights when the BVW-35P is locked to the external signal.

Lights during playing the tape back.

Lights when the color frame is not locked.

Lights when a time code generator is held.



Warning indications

The cursor corresponding to the indications below the display window shows the VTR conditions.

RF: Blinks when the recording has not been done because the head is clogged or a trouble occurs in the recording circuit.

SERVO: Blinks when the drum servo and capstan servo are not locked.

HUMID: Lights when moisture has been condensed on the head drum or when the humidity is very high.

SLACK: Blinks when the tape is slack on the take-up side of the tape transport system or when the stop of the drum rotation is detected.

TAPE END: Starts blinking about 2 minutes before the end of the tape during recording. The cursor will stay lit when the tape comes to the end.

BATT: Starts blinking when the voltage supplied by the inserted battery packs falls below 11.3V. The cursor lights up steadily when the voltage falls to 11 V.

• For details, refer to "WARNING SYSTEM" on page 57 (E).

Priority of the displayed items

When the following selectors are set as shown in the table below, the content appeared in the display window is as indicated in the table independent of the other switch setting.

Priority	Setting of selector		Displayed content
	Time code panel	Control panel	
1	REAL TIME REC ON/OFF/ SET selector→SET	—	Real time
2	F-RUN/R-RUN selector→SET	DISPLAY selector→TC	Time code
		DISPLAY selector→U-BIT	User bits
		DISPLAY selector→CTL	Time code
3	F-RUN/R-RUN selector→R-RUN or F-RUN	DISPLAY selector→CTL	CTL
		DISPLAY selector→TC	Time code
		DISPLAY selector→U-BIT	User bits



2 RESET button

When the DISPLAY selector is set to CTL and the display is in the CTL mode, pressing the RESET button sets the figures on the display to "0:00:00:00". When the REAL TIME or F-RUN/R-RUN selector is set to SET, pressing the RESET button sets the figures to "00:00:00:00".

3 WARNING lamp

Lights or blinks when one of the warning indications in the display window blinks or is lit. For details, refer to "WARNING SYSTEM" on page 57 (E).

4 DISPLAY selector

Selects the content shown in the display window.

CTL: The CTL signals are counted, and the tape running time is shown in unit of hours:minutes:seconds:frames.

TC: The display shows the time code.

U-BIT: The display shows the user bits or real time (selected by the REAL TIME REC ON/OFF/SET selector).

9 VIDEO/AUDIO METER selector

Selects the display mode of the level meters.

VIDEO: The input video signal level of the R-Y and B-Y signals (to check the component signal), the Y signal (to check the luminance signal) and the VIDEO signal (to monitor for adjusting the video level using the VIDEO LEVEL control on the connector panel) is shown on the meters from left to right.

AUDIO: The audio signal level of audio channels 1, 2, 3 and 4 is shown on the meters from left to right respectively.

10 HEADPHONES jack (stereo phone jack)

Connect 8-ohm headphones for audio monitoring. The sound selected by the MONITOR switches on the connector panel is heard. When two or more channels are selected, the mixed sound of the selected channels is heard. The monitoring sound level can be adjusted by the audio monitor level control on the connector panel. If the WARNING lamp is lit or blinks, a beep will sound in the headphones.

- The monitoring sound is monaural even if stereo headphones are used.

11 BATT (battery) button

While this button is depressed, the voltage of the batteries is shown on the right-most AFM/CH-4/VIDEO/BATT meter.

12 POWER switch

Turns the power on and off.

When a video camera is connected to the CAMERA connector, the power is supplied to the camera; when a CH1 +48V switch is set to ON, the power is also supplied to a microphone connected to the AUDIO IN CH-1 connector.

13 AUDIO REC LEVEL (audio recording level) controls

Manually adjust the audio recording level of the audio channels 1, 2, 3 and 4 respectively. The CH-1 and CH-2 controls function only when the AUDIO REC LEVEL AUTO/MAN selectors are set to MAN. While observing the corresponding meter, adjust the level so that the pointer swings up to "0" at the maximum input.

14 AUDIO PB LEVEL (audio playback level) controls

Adjust the audio playback level of audio channels 1, 2, 3 and 4 respectively.



15 REC ● button/lamp

16 PLAY ▶ button/lamp

17 STOP ■ button

18 EJECT ▲ button/lamp

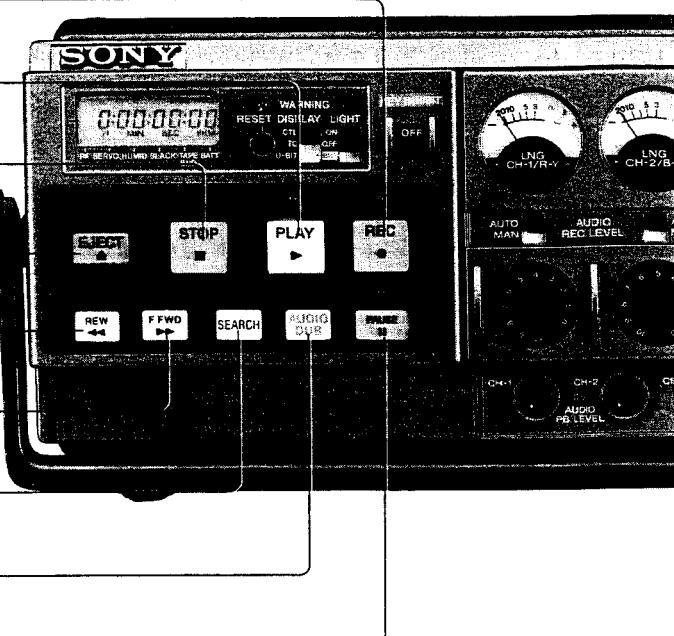
19 REW ◀ button/lamp

20 F FWD ▶ button/lamp

21 SEARCH button/lamp

22 AUDIO DUB button/lamp

23 PAUSE ■ button/lamp



15 REC ● button/lamp

For recording, press the PLAY button while pressing this button. While recording, the lamp blinks.

When only this button is pressed in the stop mode, the E-to-E mode* picture and sound can be monitored. Even if the cassette has not been inserted, the unit can enter the E-to-E mode by pressing this button. In this case, the unit automatically resumes the stop mode after about one minute.

During the fast forward, rewind or playback mode, the E-to-E mode picture can be monitored while this button is pressed.

16 PLAY ▶ button/lamp

Press to play back the tape.

For recording, press this button while pressing the REC button.

For audio dubbing, press this button while pressing the AUDIO DUB button.

17 STOP ■ button

Press to stop the tape.

18 EJECT ▲ button/lamp

Press to raise the cassette compartment to load or remove a cassette.

19 REW (rewind) ◀ button/lamp

Press to rewind the tape. The lamp lights. When the tape is fully rewound, the unit automatically stops.

When both REW and SEARCH buttons are pressed, the unit enters the search mode.

* E-to-E (Electronics to Electronics) mode
The input signals which have passed through the recorder's electronics is supplied from the output connectors. This is called the E-to-E mode.

20 **F FWD (fast forward) ►► button/lamp**
Press to advance the tape rapidly. The lamp lights. When the tape is fully wound, the tape automatically stops.
When both F FWD and SEARCH buttons are pressed, the unit enters the search mode.

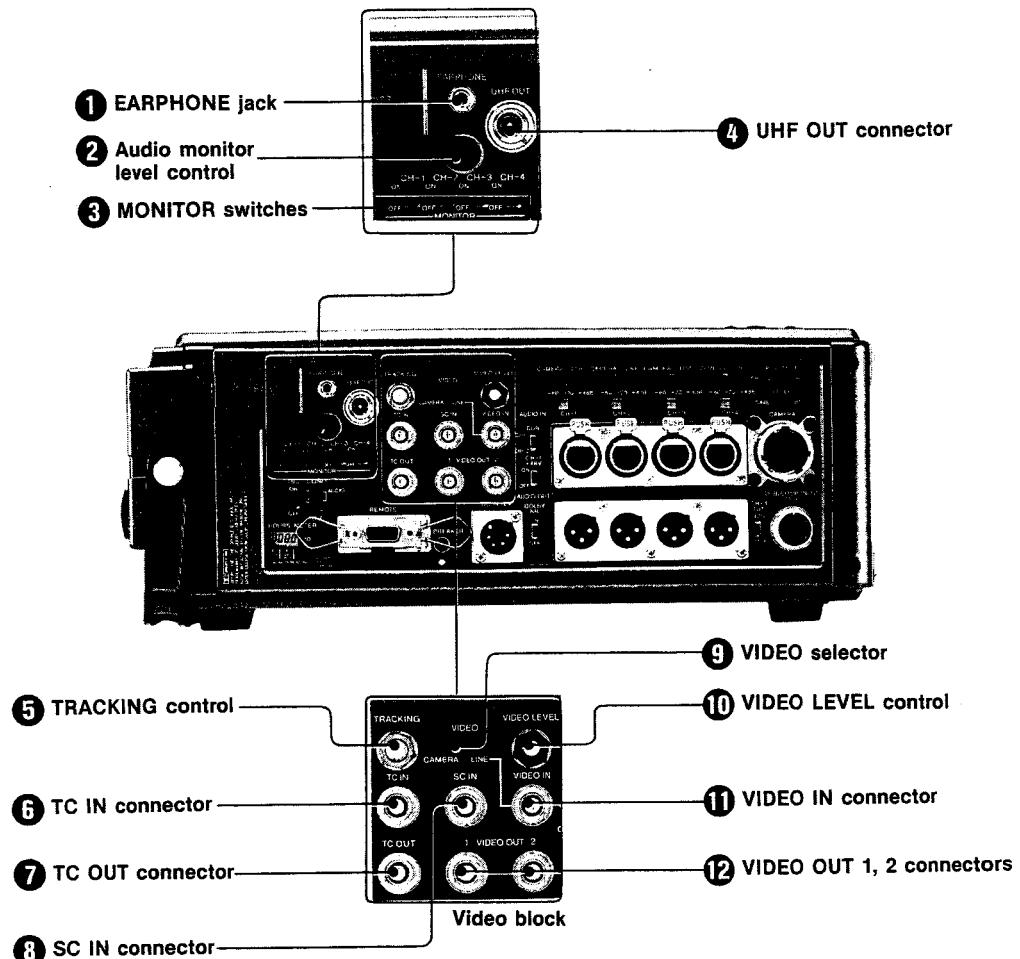
21 **SEARCH button/lamp**
Press to see the high speed playback picture (black and white) of about 3 times normal speed. While the lamp is lit, press the REW button, and the picture in reverse direction can be seen; press the F FWD button, and the picture in forward direction can be seen.
When the button is pressed in fast forward or rewind mode, the high speed playback picture can also be obtained.

22 **AUDIO DUB (audio dubbing) button/lamp**
To add the audio on the recorded tape, press this button together with the PLAY button. The audio signal will be recorded on the audio channel 1 or 2 selected by the DUB selector on the connector panel.
When only this button is pressed, the sound in E-to-E mode of the channel used for audio dubbing can be monitored

23 **PAUSE II button/lamp**
Press to momentarily stop the tape in the record or playback mode. The lamp is blinking during the pause mode. Press this button again to release the pause mode. The previous mode is resumed.
When the tape is stopped in the record mode, the E-to-E mode picture remains displayed. When the tape is stopped in the playback mode, a still picture can be monitored.



Connector Panel



1 EARPHONE jack (stereo minijack)

Connect an earphone or headphones with a stereo mini plug for audio monitoring. The sound to be monitored is selected with the MONITOR switches. When two or more channels are selected, the mixed sound of the selected channels is heard. The monitoring sound level can be adjusted with the audio monitor level control. If the WARNING lamp is lit or blinks, a beep will sound in the earphone or headphones.

- The monitored sound is monaural even if stereo headphones are connected.

2 Audio monitor level control

Adjusts the sound volume of an earphone or headphones connected to the EARPHONE jack or HEADPHONES jack.

3 MONITOR switches

Select the audio channels monitored by the earphone or headphones. Set the switch corresponding to the channel to be monitored to ON, and the sound of the channel can be heard. When two or more switches are set to ON, the mixed sound of the selected channels is heard.

4 UHF OUT connector (standard aerial IEC-type)

The video and audio playback signals are converted into the UHF channel 30 to 39, and are output from here. The output channel can be adjusted by the channel trimmer and the I/G system selector inside the unit.

Connect to the UHF antenna terminal to monitor the signal using the TV receiver.

Note

This connector is not used in the USA and Canada.

5 TRACKING control

Adjusts the tracking of the tape recorded on another recorder. If noise or streaks appear in the playback picture, turn the control with a screwdriver or a similar device so that the clear picture is obtained. Normally set to the center click position.

This control does not function during recording.

6 TC IN (time code input) connector (BNC type)

To record the external time code, connect the time code output connector on an external time code generator or another VTR. The time code generator built-in the BVW-35P is locked with the time code connected here.

7 TC OUT (time code output) connector (BNC type)

One of the followings is supplied here. Connect to the time code input connector of an external time code reader or another VTR.

During playback: Time code being played back

During recording: Time code generated by the built-in time code generator or time code generated by the built-in time code generator which is locked with the time code connected to the TC IN connector.

8 SC IN (subcarrier input) connector (BNC type)

Connect a subcarrier from the time base corrector (TBC) when the unit is connected with a TBC. The playback chrominance signal will synchronize with the subcarrier connected here.

9 VIDEO selector

Select the video signal to be recorded.

CAMERA: To record the video signal connected to the CAMERA connector.

LINE: To record the video signal connected to the VIDEO IN connector.

10 VIDEO LEVEL control

Adjusts the level of the composite video signal selected by the VIDEO selector. Use a screwdriver or a similar device to turn the control. The adjustable range is about ± 3 dB.

If the input video signal level is not 1 V(p-p), set the VIDEO/AUDIO METER selector on the control panel to VIDEO and turn the control, while observing the AFM/CH-4/VIDEO/BATT meter so that the pointer swings in the blue zone. Normally set to the center click position.

• The component signal level cannot be adjusted.

11 VIDEO IN connector (BNC type)

Connect a composite video signal here. The signal connected here will be recorded when the VIDEO selector is set to LINE.

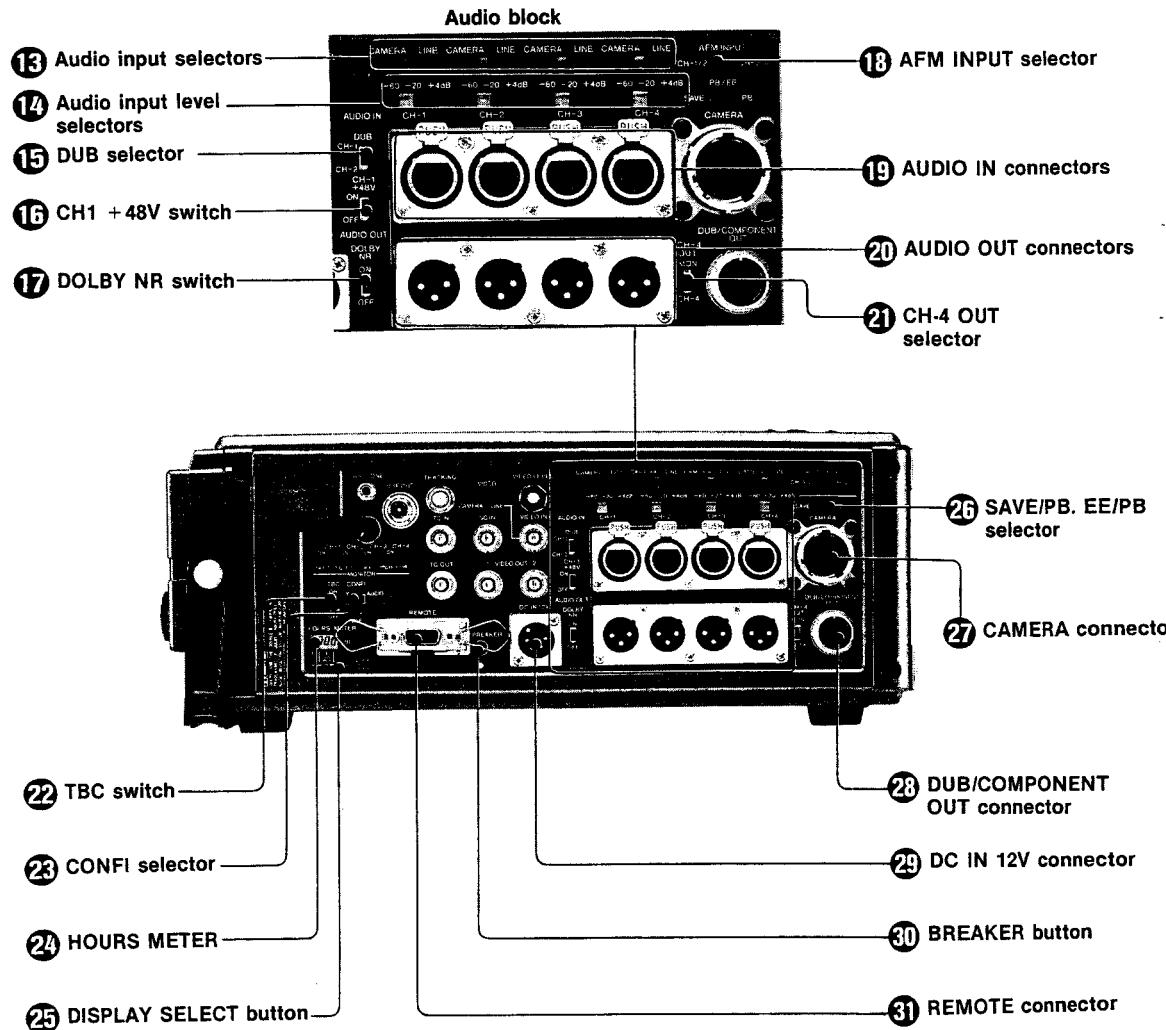
The playback signal is locked with the signal connected here.

When a time base corrector (TBC) is used, connect the sync signal (ADVANCED SYNC) from the TBC here.

12 VIDEO OUT 1, 2 connectors (BNC type)

The composite video signal is supplied here. The same signal is output from 1 and 2 connectors.

Connect to the video input connector on a video monitor, another VTR or a time base corrector.



13 Audio input selectors

Selects the audio signal to be recorded.

CAMERA: To record the audio signal connected to the CAMERA connector.

LINE: To record the audio signal connected to the AUDIO IN connectors.

14 Audio input level selectors

Select the appropriate position depending upon the audio signal level connected to the CAMERA connector or AUDIO IN connectors.

15 DUB (audio dubbing channel) selector

Selects the channel, 1 or 2, on which the audio signal is to be recorded by audio dubbing.

16 CH-1 + 48V (phantom powering) switch

Turns on and off the 48 V DC power supply to the microphone connected to the AUDIO IN CH-1 connector.

- This switch functions only when the audio input selector is set to LINE and the audio input level selector is set to -60 dB.

17 DOLBY NR (Dolby noise reduction) switch

Set the Dolby NR system on and off when oxide tape is used for longitudinal recording.

ON: To record using the Dolby NR system.

OFF: To record without using the Dolby NR system.

- When metal tape is used for recording, the Dolby NR system is always set to ON.

18 AFM INPUT selector

Selects the audio channels for AFM recording when metal tape is used.

CH-1/2: To record the audio signals connected to the AUDIO IN CH-1, CH-2 connectors. The signals will be recorded by AFM recording and at the same time recorded by longitudinal recording on the audio channels 1 and 2 tracks.

- When the selector is set to CH-1/2, the signals connected to the AUDIO IN CH-3, CH-4 connectors cannot be recorded.

CH-3/4: To record the audio signals connected to the AUDIO IN CH-3 and CH-4 connectors by AFM recording.

- The signals connected to the CH-1 and CH-2 connectors are recorded on the audio channel 1 and 2 tracks longitudinally.

19 AUDIO IN connectors (XLR 3-pin)

Connect audio signals from a microphone, audio output connectors of audio equipment or another VTR. The signals connected to the CH-1 and CH-2 connectors are recorded on the conventional audio channel 1 and 2 tracks longitudinally; the signals connected to the CH-3 and CH-4 connectors are ordinarily recorded by the AFM recording only when a metal tape is used.

20 AUDIO OUT connectors (XLR 3-pin)

The audio signal is supplied here. The output level can be adjusted by the AUDIO PB LEVEL controls on the control panel.

21 CH-4 OUT (channel-4 output) selector

Selects the output signal of the AUDIO OUT CH-4 connector.

MON: The audio signals selected by the MONITOR switches (the same signal as the output signal of the EARPHONE and HEADPHONES jacks). To monitor the audio signals through audio equipment, connect the equipment to the AUDIO OUT CH-4 connector, and set the selector to this position.

CH-4: The audio signal of the audio channel-4 is supplied.

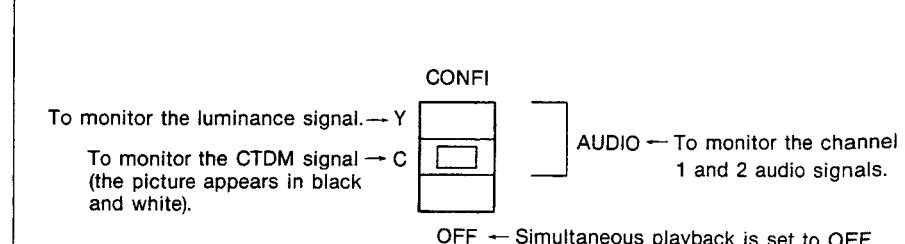
22 TBC (time base corrector) switch

ON: To play back the tape using the TBC.

OFF: To play back the tape without the TBC or using the TBC in process mode.

23 CONFI (confidential) selector

Select the simultaneous playback signal of video and audio for monitoring during recording.





24 HOURS METER

The integrating hours and times described below are displayed. Multiply the displayed figure by 10, and the actual hours or times can be obtained. The items to be displayed can be selected by pressing the DISPLAY SELECT button, and be indicated with the cursor corresponding to the indication below the meter.

OPE: The period when the power is turned on.

DRUM: Drum rotating period

TAPE RUN: Tape running period

THREADING: The number of times the tape is threaded.

25 DISPLAY SELECT button

Press to change the item to be displayed on HOURS METER.

26 SAVE/PB.EE/PB selector

Selects the condition of the BVW-35P when the unit is in the stop mode.

SAVE: The head drum stops rotating but the most circuits are not supplied with the power. Power consumption is reduced when the selector is set to this position.

- Use this position to extend the time that recording can be done when the unit is used as a portable recorder.

PB.EE: The E-to-E mode picture is obtained in the stop, fast forward and rewind modes.

- Use this position when the unit is used as a part of a system such as the FPU.

PB: A still picture is obtained in the stop mode. However, the picture quality cannot be guaranteed.

- Use this position when the unit is used as the player in an editing system. It is also recommended to use this position when the picture is monitored on a TV receiver connected to the UHF OUT connector as noise may be heard in the stop mode at the SAVE position.

27 CAMERA connector (26-pin)

Connect to the multi connector of a color video camera. The video and audio signals from the camera and the power and the control signal to the camera from the BVW-35P can be connected by a single cable.

If a camera with a component output such as a BVP-5P (a CA-3A camera adaptor is necessary) is connected, the component signal is recorded, which results in a high quality picture and low power consumption. When the component signal is not input, the composite signal will be recorded automatically.

28 DUB/COMPONENT OUT connector (12-pin)

The component video signal of the luminance (Y), chrominance (R-Y, B-Y) and Compressed Time Division Multiplex (CTDM) signal is supplied.

To dub or edit the video signal, connect to the DUB/COMPONENT input connector with the 12-pin dubbing cable. Picture quality deterioration can be reduced.

29 DC IN 12V connector (XLR 4-pin)

Connect the DC power source from an AC-500CE AC power adaptor (optional) to operate the unit with an AC power source.

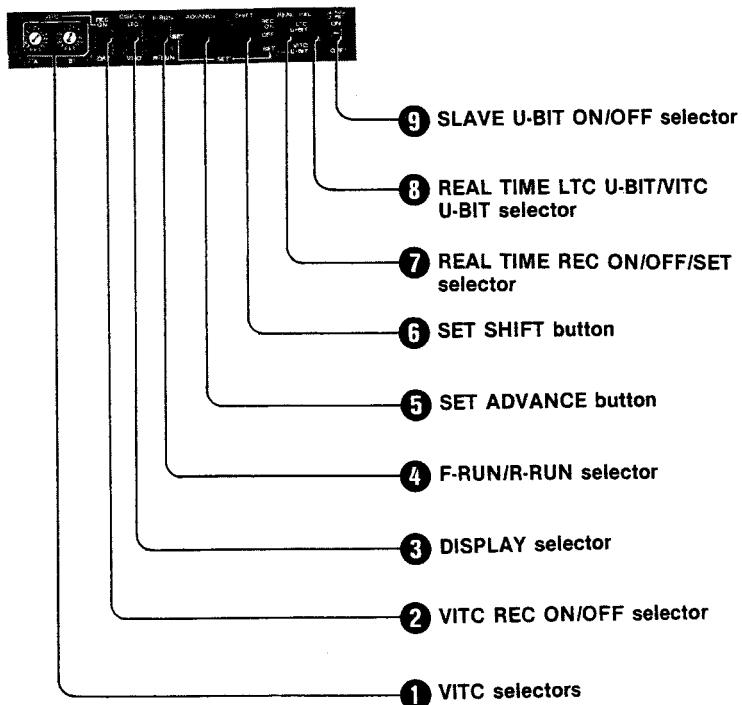
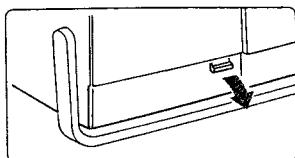
30 BREAKER button

When an excessive current flows during operation, the power to this unit is cut off. After checking inside the unit, press this button to restore the power to the unit.

31 REMOTE connector (9-pin)

Connect to the 9-pin remote connector on a "Betacam" or "Betacam SP" series VTR such as a BVW-75P, or on a BVE series editing control unit such as a BVE-800, BVE-900 for editing, or on a remote control unit such as a BVR-820.

Time Code Panel



① VITC (vertical interval time code insert line) selectors

Select the V-blanking lines where VITC is to be inserted. Set the arrow at the line number to be inserted. The figures on the selectors and the line numbers correspond as shown in the table on the next page.

The A and B controls select the line independently to insert the same VITC on two lines which are not adjacent.

Notes

- Select the lines where no VITS (Vertical Interval Test Signal) or VIRS (Vertical Interval Reference Signal) is inserted.
- On line 8, the reference SC signal is inserted, so the VITC cannot be inserted.



Switch setting	VITC insertion line No.
0	line 7
1	8
2	9
3	10
4	11
5	12
6	13
7	14
8	15
9	16
A	17
B	18
□ C	19
□ D	20
□ E	21
F	22

Note: "□" indicates the factory setting.

2 VITC REC ON/OFF (VITC recording on/off) selector

ON: To record the VITC.

- The LTC (Longitudinal Time Code) and VITC are recorded simultaneously.

OFF: To not record the VITC.

- Only the LTC is recorded.

3 DISPLAY selector

Select the time code displayed on the display window when the DISPLAY selector on the control panel is set to TC or U-BIT.

LTC: LTC is displayed.

VITC: VITC is displayed.

4 F-RUN/R-RUN (free run/record run) selector

Selects the operating mode of the built-in time code generator.

F-RUN: The generator continues to generate the time code independent of the operation mode of the unit. Set to this position to generate the time code of the real time or to lock the time code to an external time code generator.

SET: To set the time code or user bits data, set to this position. The figures on the display window blink.

R-RUN: The generator generates the time code only when the unit is in the record mode. The time code recorded on the tape will be almost consecutive.

5 SET ADVANCE button

When the F-RUN/R-RUN selector is set to SET, press this button to change the displayed figure. Every time the button is pressed, the figure increases by one. When the button is kept depressed, the figure changes continuously.

6 SET SHIFT button

When the F-RUN/R-RUN selector is set to SET, press this button to shift the blinking figure. Every time the button is pressed, the blinking figure is shifted to the right.

7 REAL TIME REC ON/OFF/SET selector

Selects whether the real time is to be recorded as a part of the user bits data or not.
REC ON: To record the real time.

OFF: To not record the real time. If the real time has been set, the built-in clock keeps operating, but on the display the user bits is displayed.

SET: To set the real time. The real time is shown on the display window independent of the DISPLAY selector setting.

8 REAL TIME LTC U-BIT/VITC U-BIT selector

Selects the time code to which the real time is to be inserted.

LTC U-BIT: To insert the real time into the user bits of the LTC.

VITC U-BIT: To insert the real time into the user bits of the VITC.

9 SLAVE U-BIT ON/OFF selector

Selects whether the user bits are to be locked with the external user bits or not.

ON: The user bits are locked with the external user bits. The same value as the external user bits is displayed and recorded.

OFF: The user bits are not locked. The user bits generated by the built-in time code generator are displayed and recorded.

POWER SUPPLY



The BVW-35P can operate either with a rechargeable battery pack or with an AC power source. To operate with a battery pack, use a BP-90 battery pack (optional) or two NP-1 or NP-1A battery packs (optional). To operate with an AC power source, an AC-500CE AC power adaptor (optional) is necessary.

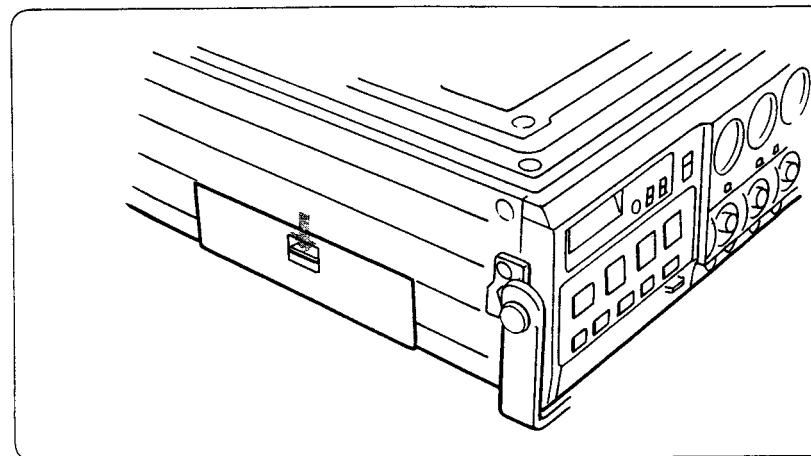
Using the BP-90 Battery Pack

Battery Charging

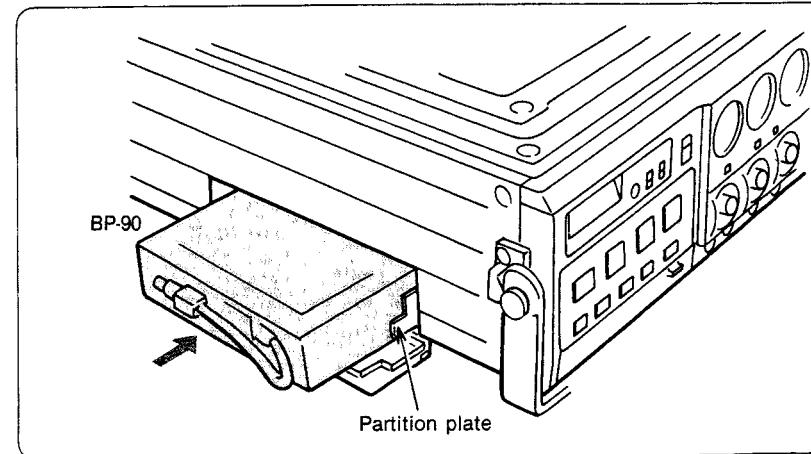
Before inserting the battery pack, charge it using a BC-210CE battery charger (optional). For details, refer to the operation manual furnished with the BC-210CE battery charger.

Battery Pack Insertion

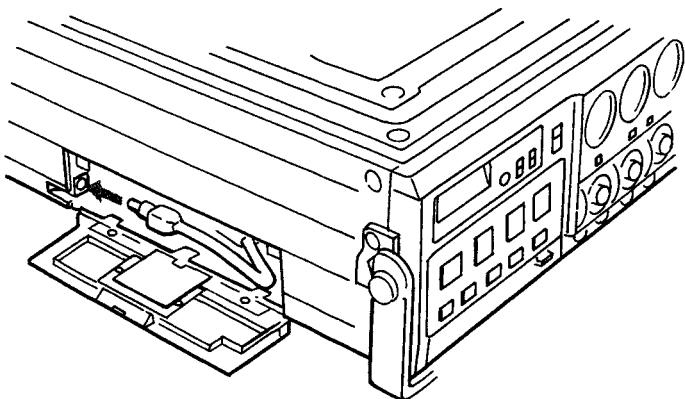
- 1 Open the battery compartment lid.



- 2 Check that the partition plate is placed at the right end of the compartment, and insert a BP-90 battery pack.



3 Connect the plug.



4 Close the compartment lid.

Battery Life

A fully charged battery pack BP-90 allows continuous recording for about 80 minutes under normal temperature when only the BVW-35P is operated. If the BVP-330AP color video camera is used together, the continuous operation for about 50 minutes will be possible.



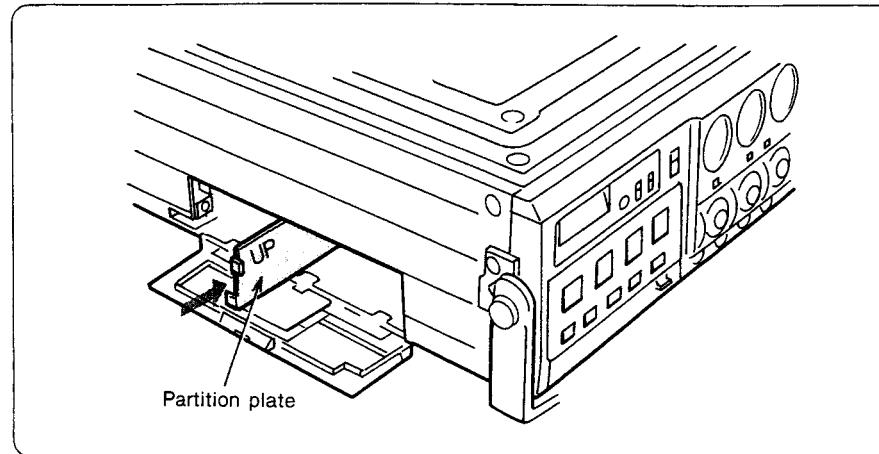
Using the NP-1 or NP-1A Battery Packs

Battery Charging

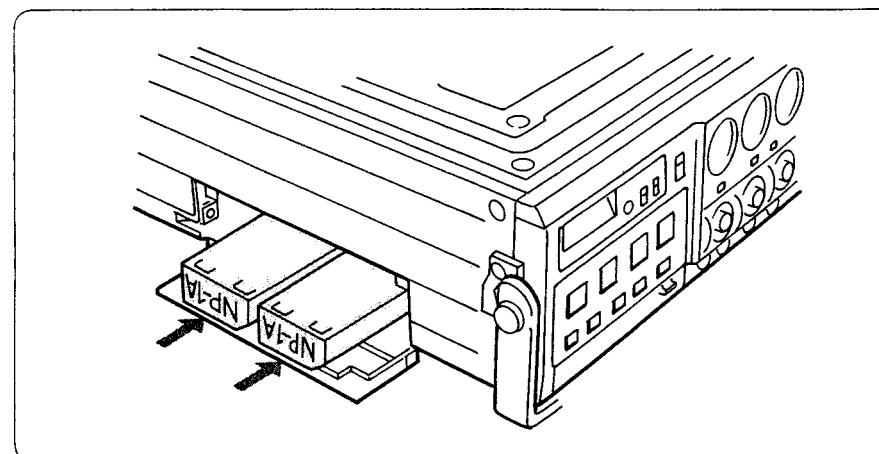
Before inserting the battery packs, charge them using a BC-1WA battery charger. Charging a battery pack requires about one hour. For details, refer to the operation manual furnished with the BC-1WA battery charger.

Battery Pack Insertion

- 1 Open the battery compartment lid.
- 2 Insert the partition plate at the middle of the compartment with the "UP" mark positioning upward.



- 3 Insert two battery packs according to the instructions on the lid.



- 4 Close the compartment lid.

To Remove the Battery Packs

Push the yellow PUSH buttons in the battery compartment.

Battery Life

Fully charged battery packs NP-1s or NP-1As allow continuous recording for about 55 minutes under normal temperature when only the BVW-35P is operated. If the BVP-330AP color video camera is used together, the continuous operation for about 30 minutes will be possible.

Notes on Battery Packs

- A little power is always supplied to the time code generator even when the POWER switch is set to OFF. Remove the battery packs from the battery compartment if the unit will not be used for a long period of time or during the transportation.
- Use in an extreme hot or cold location may shorten the life of the battery pack.
- When the battery voltage falls to the lower line, the BATT indicator blinks and the WARNING lamp lights to warn you that the battery packs are almost exhausted. Replace it (or them) with fully-charged battery pack(s). If the battery packs are not replaced, the BATT indicator lights up and the unit automatically stops.
- When the NP-1s or NP-1As are replaced with charged battery packs, be sure to replace both battery packs. Or the over charging current flows to the discharged battery from a charged battery, and the breaker inside the battery may be activated.
- The battery may not be fully charged when it is warm just after the use.

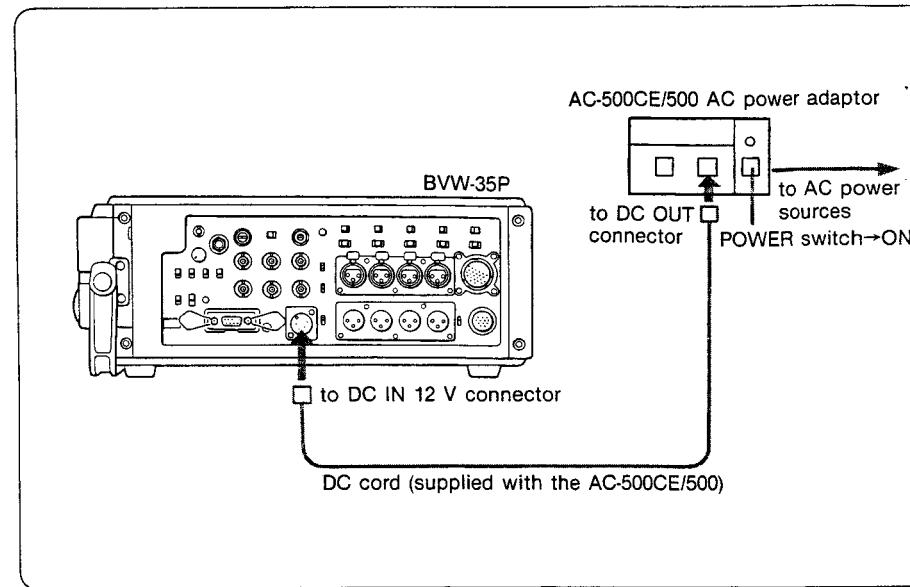
To check the battery

Press the BATT button, and check that the pointer of the AFM CH-4/VIDEO/BATT meter swings into the green zone.



AC Operation

To operate the BVW-35P with an AC power source, connect the AC-500CE/500 AC power adaptor (optional) as shown below.



Note

When the AC power adaptor is connected to the DC IN 12 V connector, the power supply from the battery is automatically disconnected. However if the voltage connected to the DC IN 12 V connector is lower than that of the battery packs, a little current flows and the power may be consumed from the battery pack.

INSERTION AND REMOVAL OF A VIDEO CASSETTE

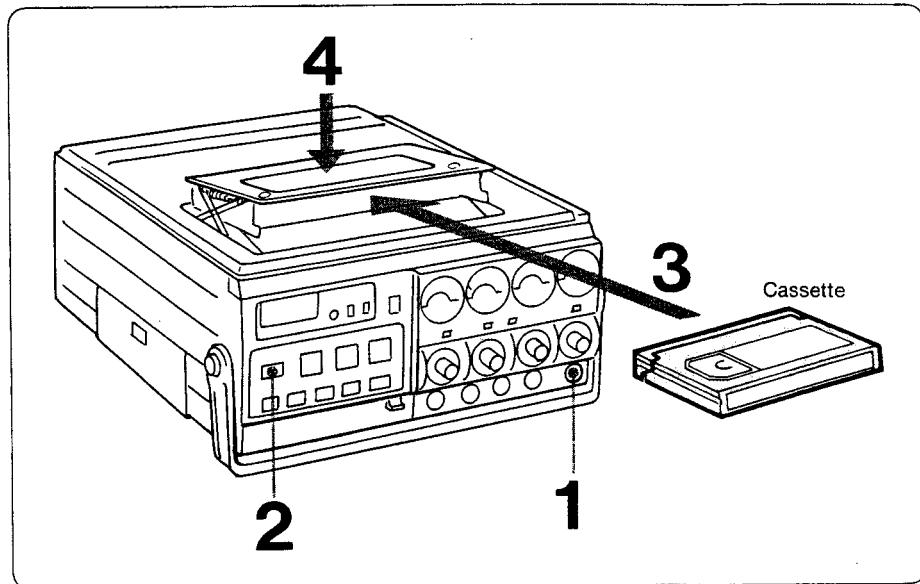
Usable Cassettes

A "Betacam" or "Betacam SP" cassettes as shown below can be used.

Metal tape: BCT-5M/10M/20M/30M or equivalent

Oxide tape: BCT-5G/10G/20G/30G or equivalent

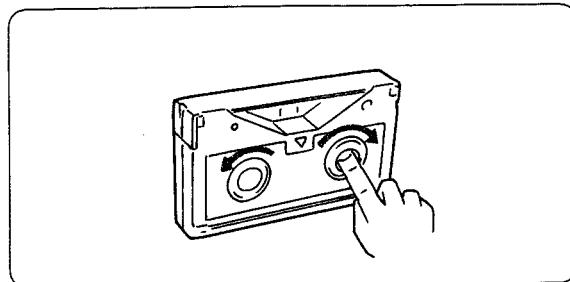
To Insert a Cassette



- 1 Set the POWER switch to ON.
- 2 Press the EJECT button.
The cassette compartment rises.
- 3 Insert a cassette after confirming no slack on the tape.
- 4 Push down the compartment by pressing the position marked "PUSH" until it locks.

Notes

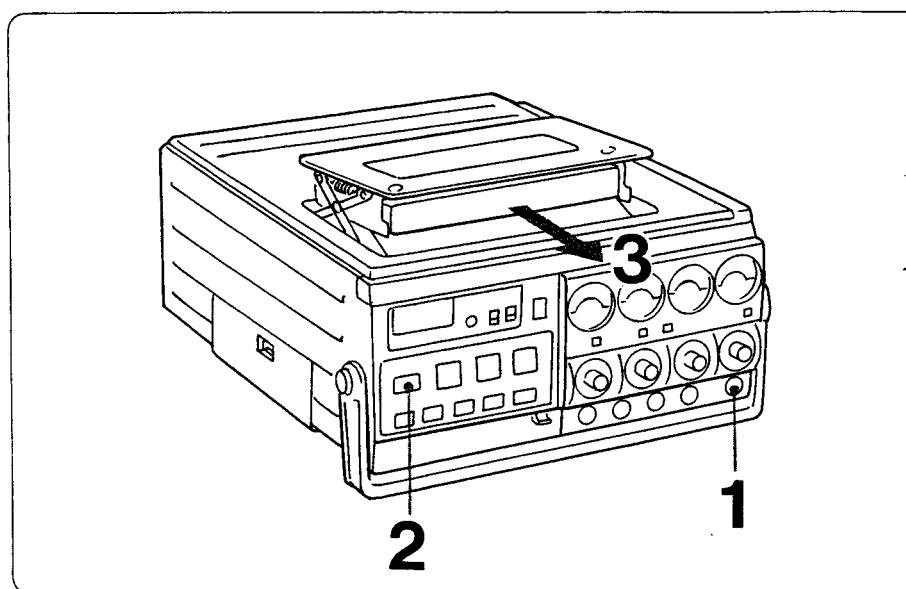
- If the tape is slackened, wind it up.



- If the WARNING lamp and HUMID indication light when the POWER switch is set to ON, the moisture has condensed inside the machine. Do not insert a cassette. Turn off the power and wait until the WARNING lamp and HUMID indication do not light when the power is turned on.



To Remove a Cassette

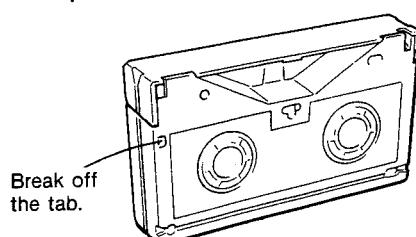


- 1 Check that the power is turned on.
- 2 Press the EJECT button.
The cassette compartment rises.
- 3 Remove a cassette.

To avoid accidental erasure

To safeguard the material recorded on a cassette, proceed as follows. Then the REC lamp does not light and recording will not begin even if the REC button is pressed.

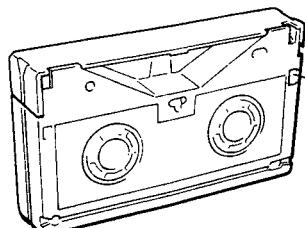
Oxide tape



Break off
the tab.

- To record on the cassette again, cover the hole with a cellophane tape, etc.

Metal tape



Push the
plug in.

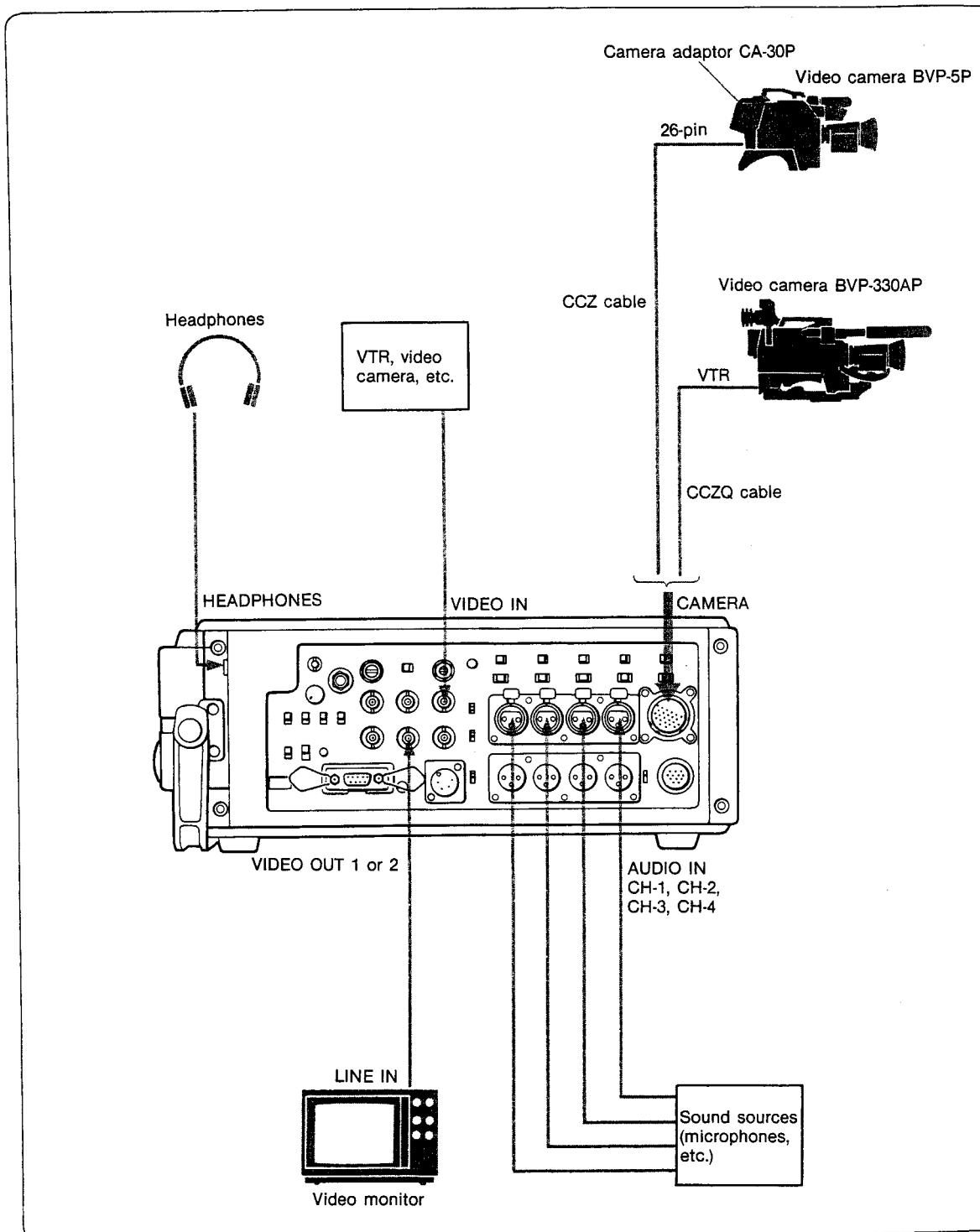
- To record on the cassette again, pull the plug out.

RECORDING

When metal tape is used for recording, the video signals are recorded with the "Betacam SP" system. The audio signals are recorded on audio channels 1 and 2 in the conventional longitudinal direction using the Dolby NR system, and audio channels 3 and 4 are recorded with the AFM recording.

When oxide tape is used, the video signals are recorded with the conventional system, and the audio signals are recorded on audio channels 1 and 2 longitudinally. The Dolby NR system can be turned on and off. The audio channels 3 and 4 cannot be recorded.

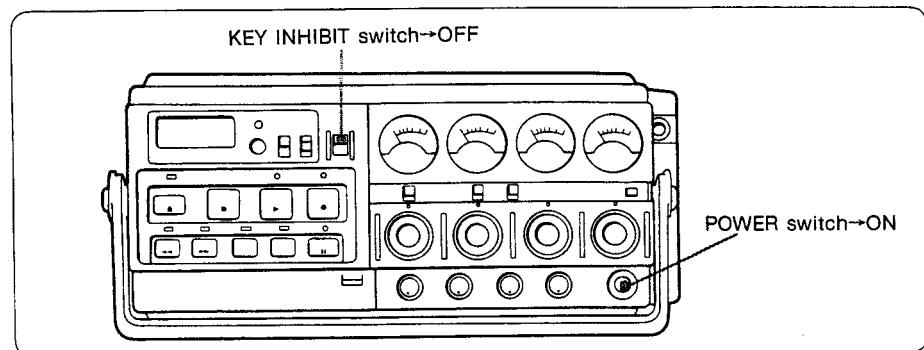
Connections



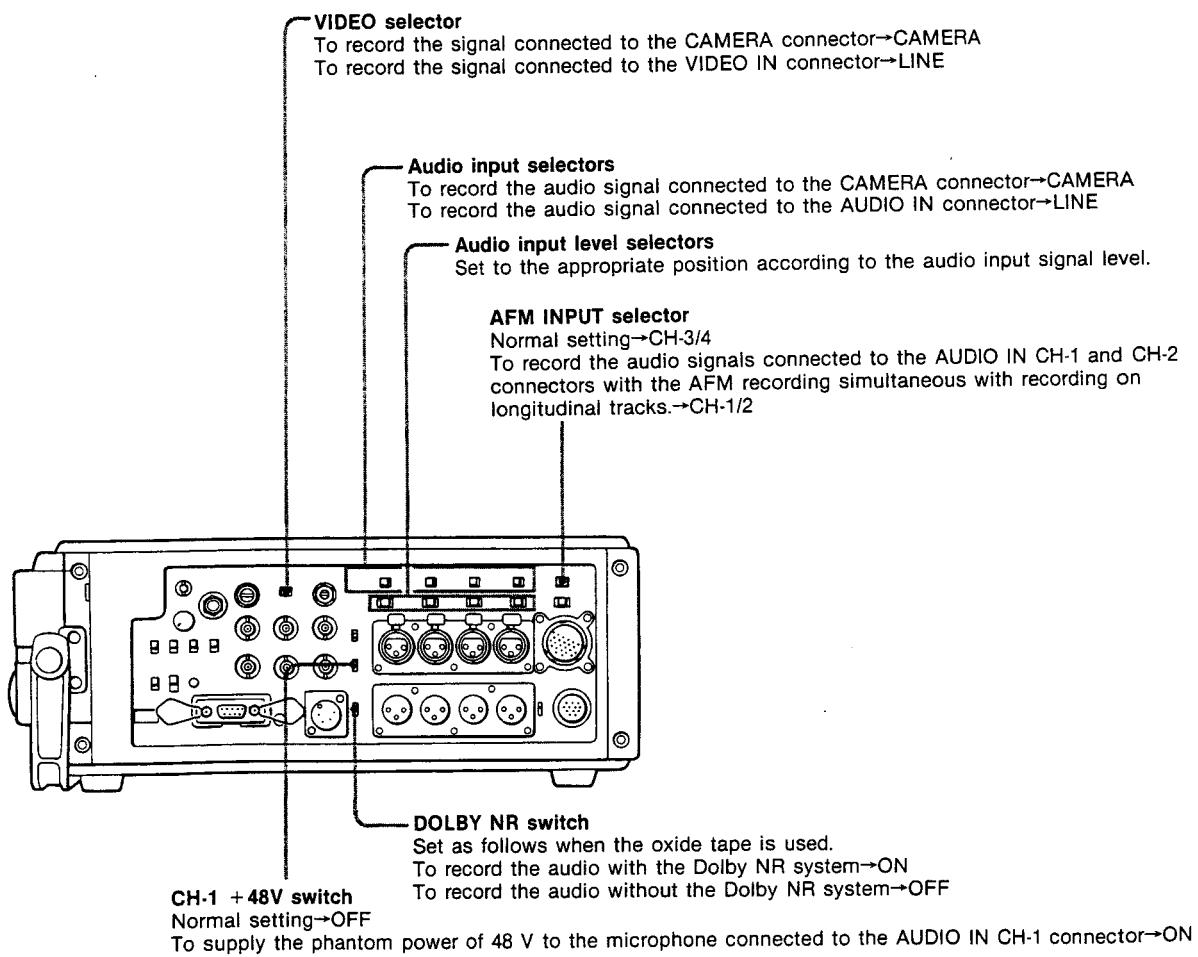
Preparations

Setting of Switches

Control panel



Connector panel

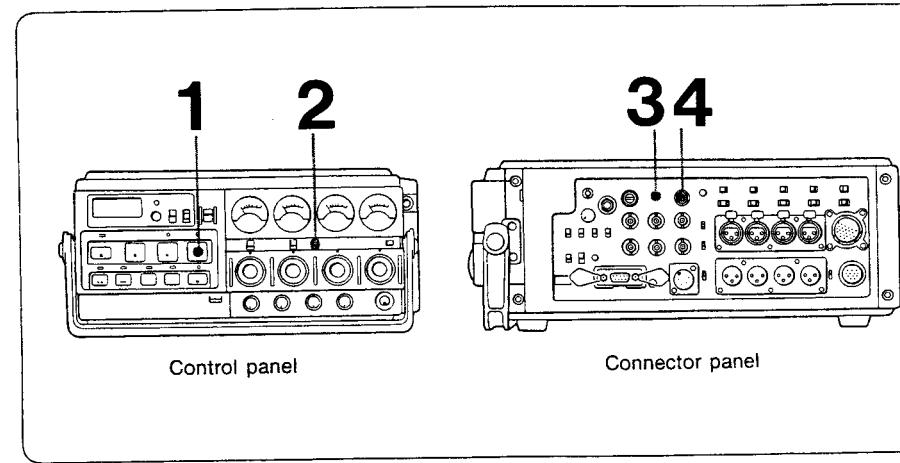


Cassette Insertion

- 1 Press the EJECT button.
- 2 Insert the cassette.
- 3 Push the cassette compartment to close it.

Video Level Adjustment

The video signal recording level is automatically adjusted so that the optimum value can be obtained when the signal of the reference level is input. So the manual adjustment is not required. Only when the composite signal level connected to the VIDEO IN or CAMERA connector is far from the standard level, adjust the level as follows.



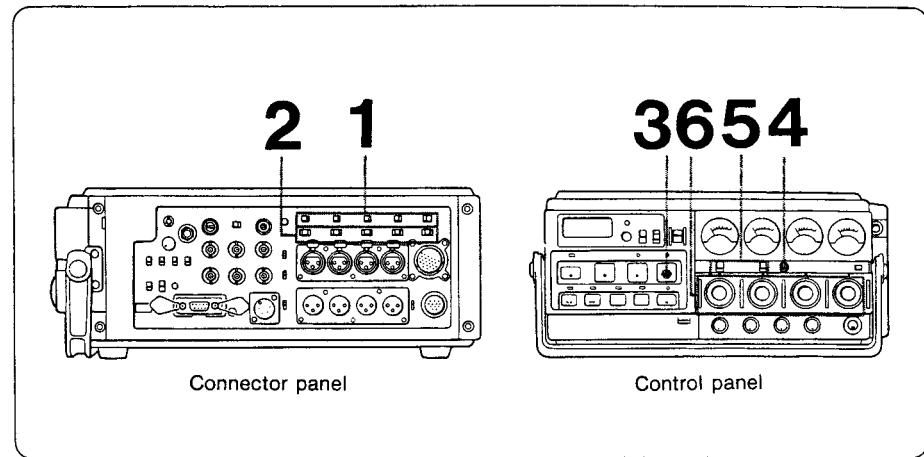
- 1 Supply the video signal and press the REC button.
The E-to-E mode is obtained.
- 2 Set the VIDEO/AUDIO METER selector to VIDEO.
- 3 Set the VIDEO selector according to the connection of the video signal.
- 4 Observing the AFM CH-4/VIDEO/BATT meter, turn the VIDEO LEVEL control with a screwdriver so that the pointer swings in the blue zone.

Audio Recording Level Adjustment

The recording of the audio channels 1 and 2 on longitudinal tracks makes it possible to adjust the audio recording level automatically or manually. For automatic adjustment, set the AUDIO REC LEVEL AUTO/MAN selectors to AUTO.

The recording level of the AFM recording on audio channels 3 and 4 should be adjusted manually so that the optimum level is obtained.

For manual adjustment, proceed as follows.



- 1** Set the audio input signal selector according to the connection of the audio signals to be recorded.
- 2** Set the audio input signal level selector according to the level of the audio signals to be recorded.
- 3** Press the REC button.
The E-to-E mode is obtained.
- 4** Set the VIDEO/AUDIO METER selector to AUDIO.
- 5** To adjust the audio channels 1 and 2, set the AUDIO REC LEVEL AUTO/MAN selectors to MAN.
- 6** Turn the AUDIO REC LEVEL controls so that the pointer swings up to "0" at the maximum deflection.

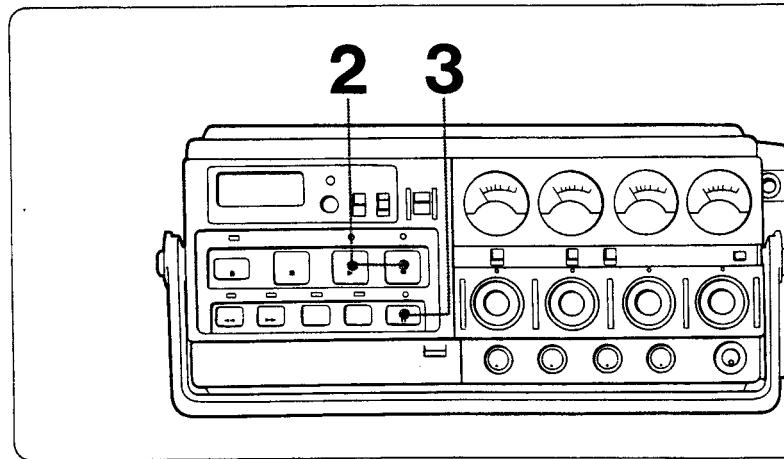
Time Code and User Bits Setting

To record the time code and user bits, previously set the necessary data. For details, refer to "Time Code" on page 47 (E).



Operation

To Record the Signal Connected to the CAMERA Connector



- 1 Adjust the camera.
- 2 Press the PLAY button while pressing the REC button.
The record standby mode is obtained.
- 3 Press the VTR start/stop button on the camera or the PAUSE button on the BVW-35P.
The recording will begin.

To stop recording momentarily

When the recording has been started by the VTR start/stop button on the camera, press the VTR start/stop button. The PAUSE button does not function.

When the recording has been started by the PAUSE button, press either the PAUSE button or the VTR start/stop button.

In the pause mode, the PAUSE lamp is blinking.

To restart recording, press the PAUSE button or the VTR start/stop button again.

To Record the Signal Connected to the VIDEO IN Connector

- 1 Adjust the camera.
- 2 Press the PLAY button while pressing the REC button.
The recording will begin.

Note

The VTR start/stop button on the camera does not function.

To stop recording momentarily

Press the PAUSE button. To restart recording, press the PAUSE button again.

To Stop Recording

Press the STOP button.

Automatic Release of Pause Mode

When the recording is stopped momentarily, the PAUSE lamp blinks. On the video monitor, the E-to-E mode picture is remained.

When the pause mode continues for about 30 minutes, the tape protection mechanism will activate, and the pause mode is automatically released and the VTR enters the stop mode. The E-to-E mode picture disappears.

To Prevent the Accidental Interruption of Recording

To prevent the recording from being accidentally interrupted by mis-operation of any buttons, any button except for the STOP and PAUSE buttons do not function during recording.

To inhibit the STOP and PAUSE buttons, set the KEY INHIBIT switch to ON after starting recording. Any function buttons will not operate. To stop recording, set the KEY INHIBIT switch to OFF, then press the STOP button.

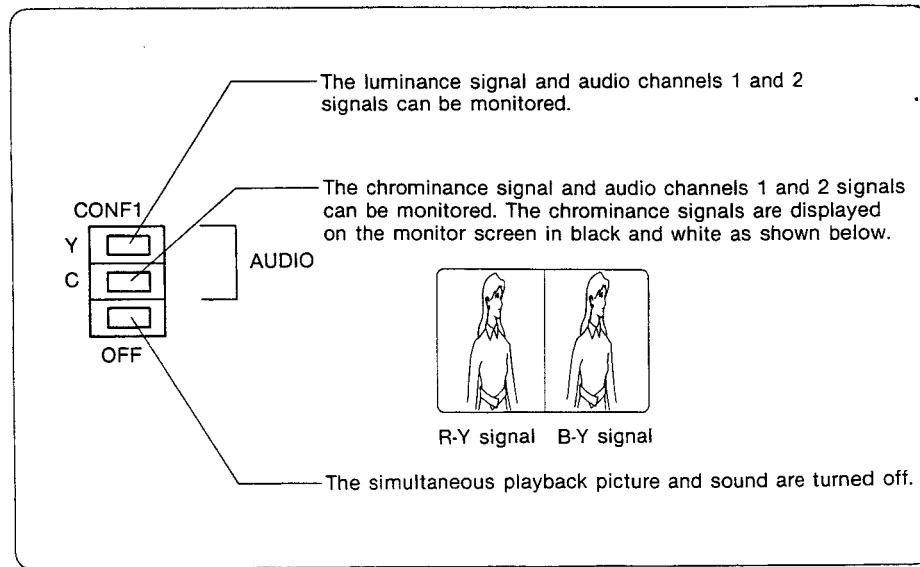
If the Tape does not Run in the Record Mode

The tape will not run if a video signal is not supplied. If this happens, set the VIDEO/AUDIO METER selector to VIDEO and check that the pointer of the AFM CH-4/VIDEO/BATT meter swings in the blue zone.



To Monitor the Simultaneous Playback Signals

During recording, the recorded video and audio signals can be simultaneously played back for monitoring. Set the CONF1 selector on the connector panel as shown below. When a camera is connected to the CAMERA connector, press the RET button on the camera, and the picture selected by the CONF1 selector can be monitored on the viewfinder.



Note

A recording signal may affect the simultaneous playback picture by beat, thus the picture cannot be used to check the picture quality.

PLAYBACK

When playing back the tape, the format used for recording, conventional or "Betacam SP", is automatically detected by the type of tape (metal tape or oxide tape), and an appropriate circuit is used for playback.

Connections and Preparations

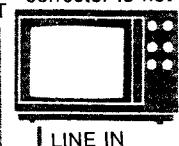
To monitor the video signal

When a time base corrector is used

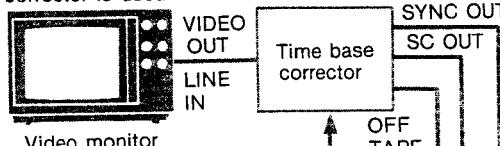


Video monitor

When a time base corrector is not used



Video monitor



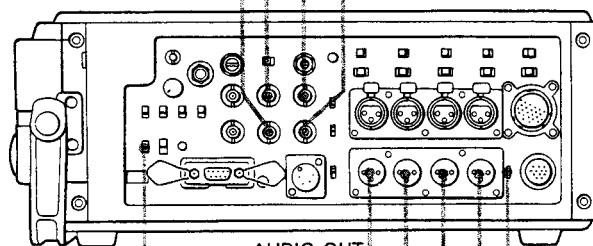
Reference signal

VIDEO OUT 1 or 2

SC IN

VIDEO IN

VIDEO OUT 1 or 2



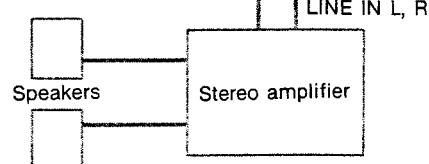
TBC switch

When a TBC is used → ON

When a TBC is not used → OFF

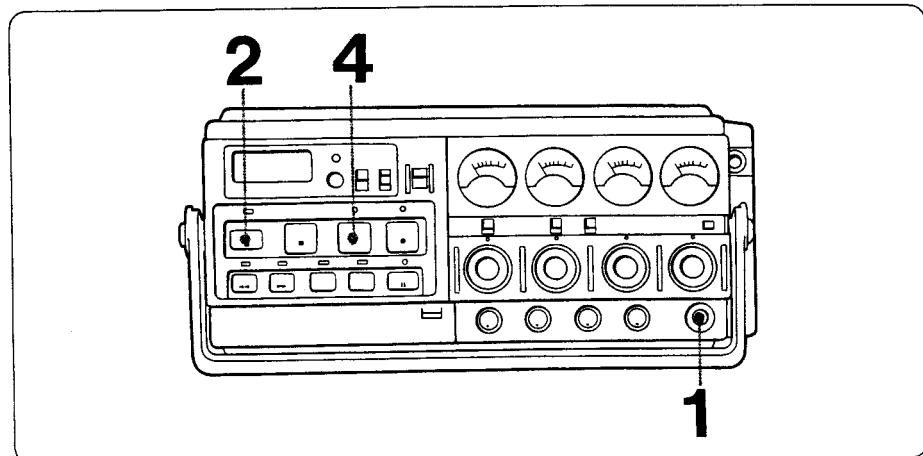
AUDIO OUT
CH-1, CH-2,
CH-3, CH-4

CH-4 OUT
selector → CH-4



To monitor the audio signal

Operation



- 1 Set the POWER switch to ON.
- 2 Press the EJECT button.
The cassette compartment rises.
- 3 Insert a cassette to be played back.
- 4 Press the PLAY button.
Playback will begin.

To Stop Playback Momentarily

Press the PAUSE button. In the pause mode, the PAUSE lamp blinks, and a black and white still picture can be monitored.
To release the pause mode, press the PAUSE button again.

Automatic release of pause mode

When the pause mode continues for about 8 minutes, the tape protection mechanism will activate, and the pause mode is automatically released and the VTR enters the stop mode.

To Stop Playback

Press the STOP button.

Audio Playback Level Adjustment

- 1 Set the VIDEO/AUDIO METER selector to AUDIO.
- 2 Turn the AUDIO PB LEVEL controls.
Observing the level meters, adjust the level so that the pointer swings up to "0" at the maximum deflection.

Tracking Adjustment



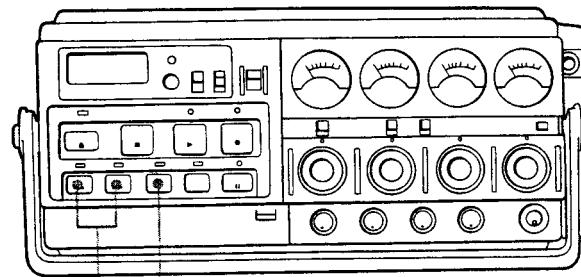
When a tape recorded on another recorder is played back, noise or streaks may appear on the playback picture. In such a case, turn the TRACKING control on the connector panel with a screwdriver so that the clear picture is obtained.

Note

When the playback of the tape whose tracking is adjusted finishes, be sure to set the TRACKING control to the center click position.

Search Operation

The high speed playback picture of about 3 times normal playback speed can be monitored in forward and reverse directions. The playback picture is black and white, and guard band noise may appear.



1 Press the SEARCH button.

The lamp will light and the still picture will appear. (pause mode)

2 Press the F FWD button, and the high-speed playback picture in forward direction can be seen.

Press the REW button, and the high-speed playback picture in reverse direction can be seen.

- When the SEARCH button is pressed in the fast forward or rewind mode, the search function will also be activated.
- If the pause mode continues for about 8 minutes after the SEARCH button is pressed, the pause mode will be released automatically and the VTR enters the playback in slow mode.

To terminate the search operation

Press the SEARCH button, and the lamp will go out.

Reading and Displaying Time Code and User Bits

When the time code and user bits are recorded on the tape to be played back, the built-in time code reader reads them. By setting the DISPLAY selector on the control panel, the time code or user bits is shown on the display window.

To display the time code→TC

(By setting the DISPLAY selector on the time code panel, the displayed time code, LTC or VITC, can be selected.)

To display the user bits→U-BIT

- Time code and user bits read by the built-in time code reader are supplied from the TC OUT connector on the connector panel.
- For details, refer to "TIME CODE" on page 47 (E).

To Monitor the Playback Picture on a TV Receiver

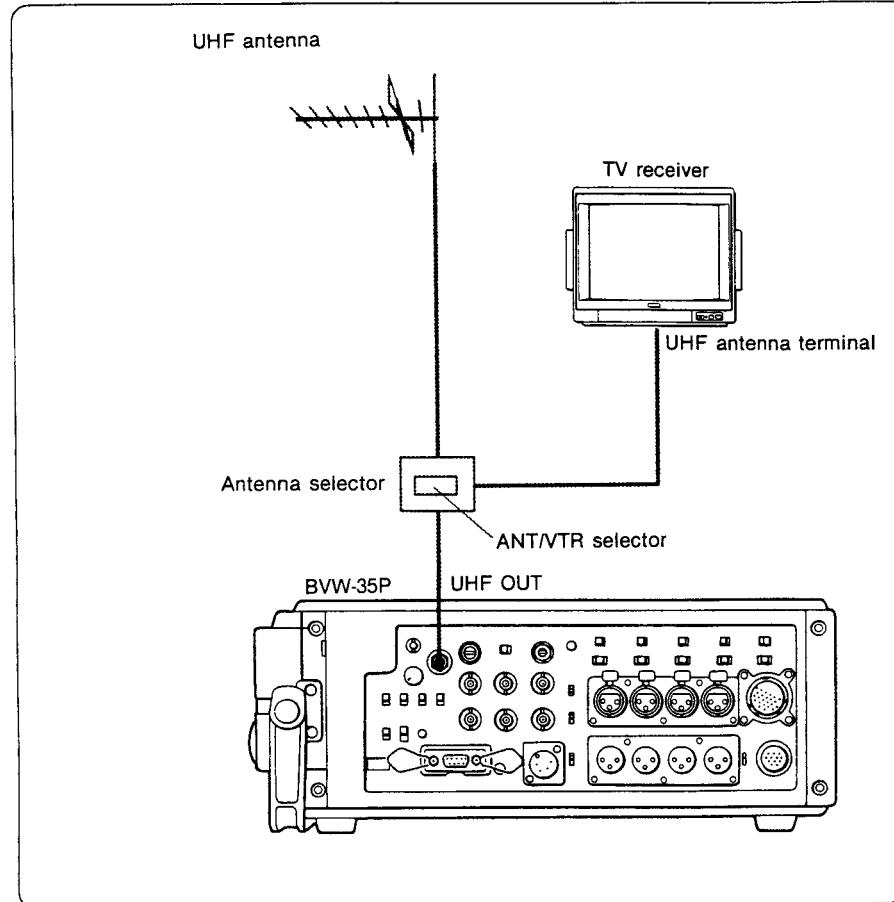


The BVW-35P is furnished with the RF modulator which converts the playback signal to the UHF channel 30 to 39 of TV signal. The converted signal is supplied from the UHF OUT connector on the connector panel.

Note

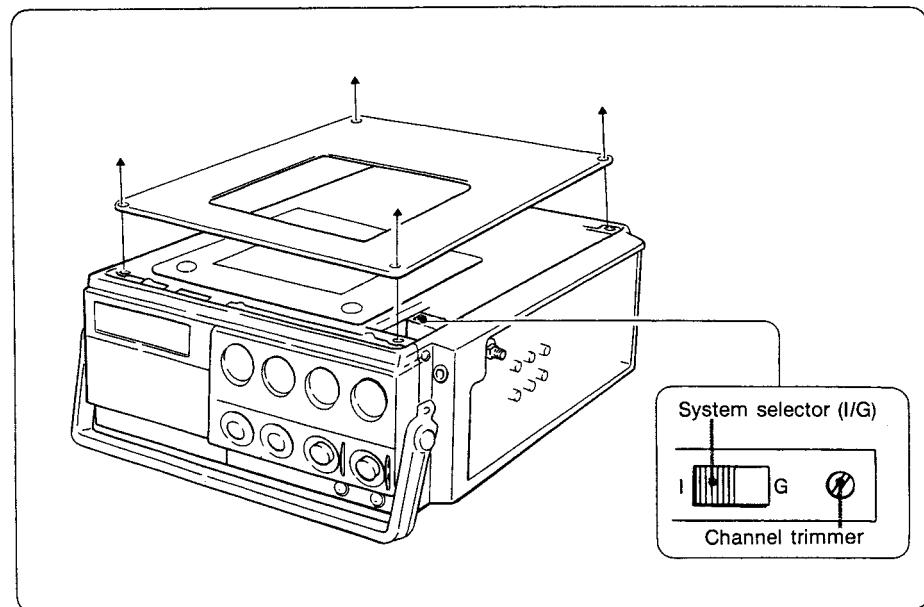
The UHF OUT connector is not used in the USA and Canada.

Connections



Output Channel and TV System Selection

The output channel is set to 36 and the system selector is set to "G" at the factory. To change the channel and the system, proceed as follows.



- 1** Remove 4 screws on the upper panel, and then the panel.
- 2** Set the system selector to I or G according to your TV system.
- 3** Adjust the channel trimmer in the unit to the unused channel (channel 30 to 39).
- 4** Press the EJECT button to raise the cassette compartment.
- 5** Attach the panel and fasten it with the 4 screws.

Operation

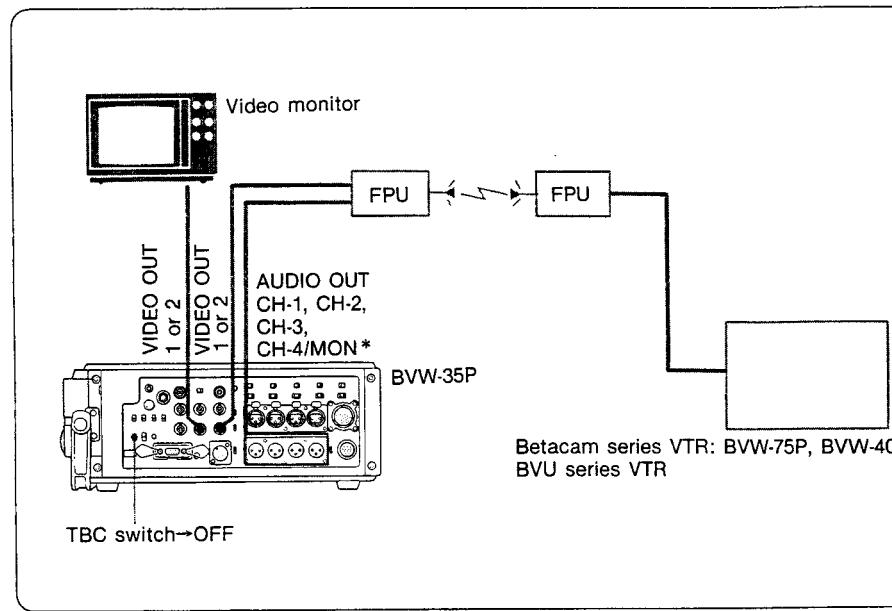
- 1** Turn the power of the TV on, and select the same channel as the setting of the channel selector of the BVW-35P.
- 2** Set the ANT/VTR selector on the antenna selector to VTR.
- 3** Play the tape back.



To Transmit the Playback Picture Using an FPU (Field Pickup Unit)

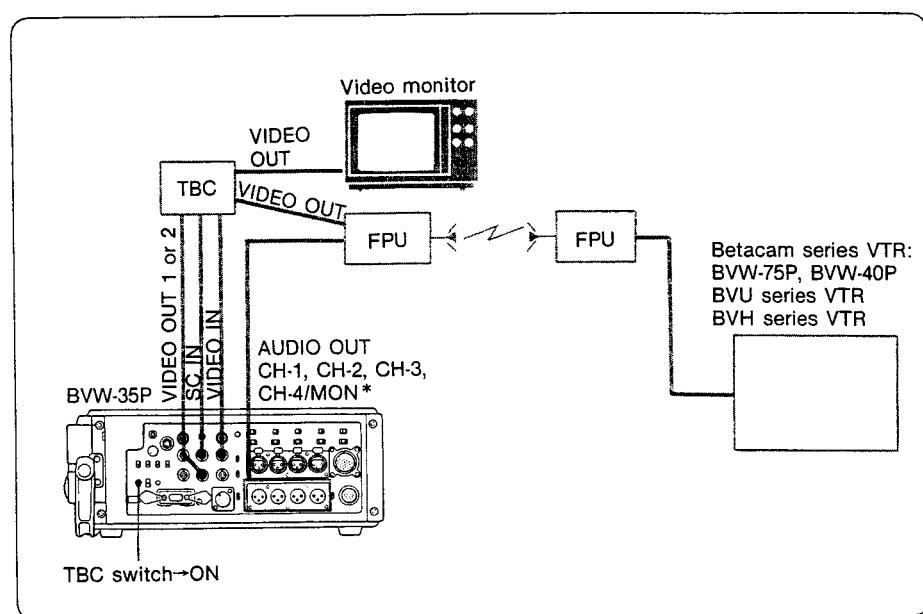
The playback signal can be transmitted over the microwaves when an FPU is used.

Connection example 1



* When the audio signal is transmitted using one channel, it is recommended to use the CH-4 connector by setting the CH-4 OUT selector to MON and selecting the output channels with the MONITOR switches to mix the channels to be transmitted.

Connection example 2



- When a BVT-2000P time base corrector is used, set the ADVANCE SYNC AUTO/MANUAL selector on the printed circuit board of the BVT-2000P to MANUAL.

* When the audio signal is transmitted using one channel, it is recommended to use the CH-4 connector by setting the CH-4 OUT selector to MON and selecting the output channels with the MONITOR switches to mix the channels to be transmitted.

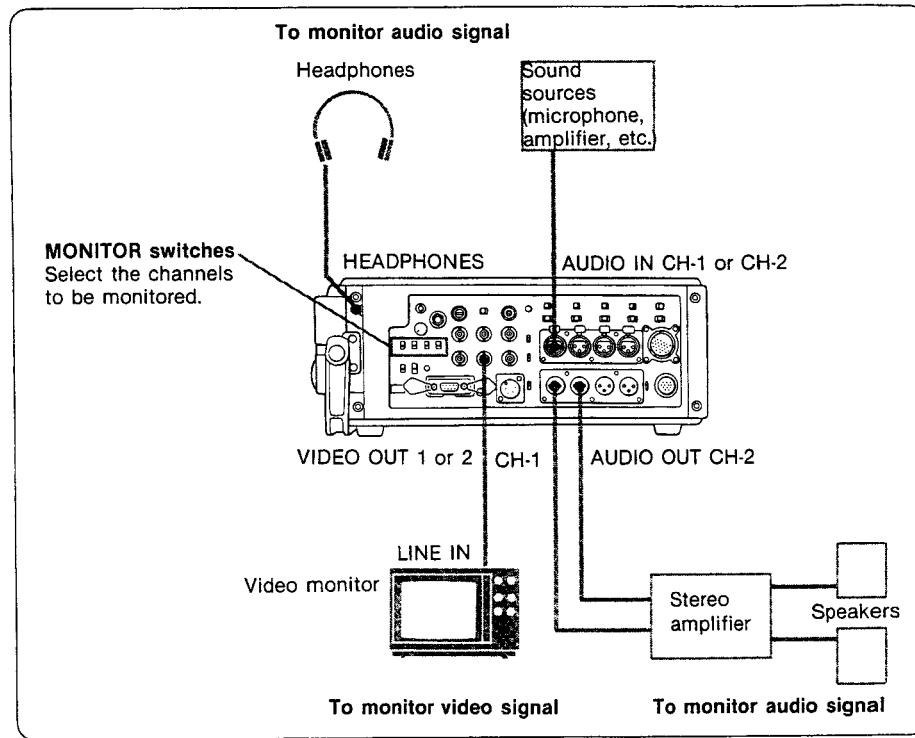
AUDIO DUBBING



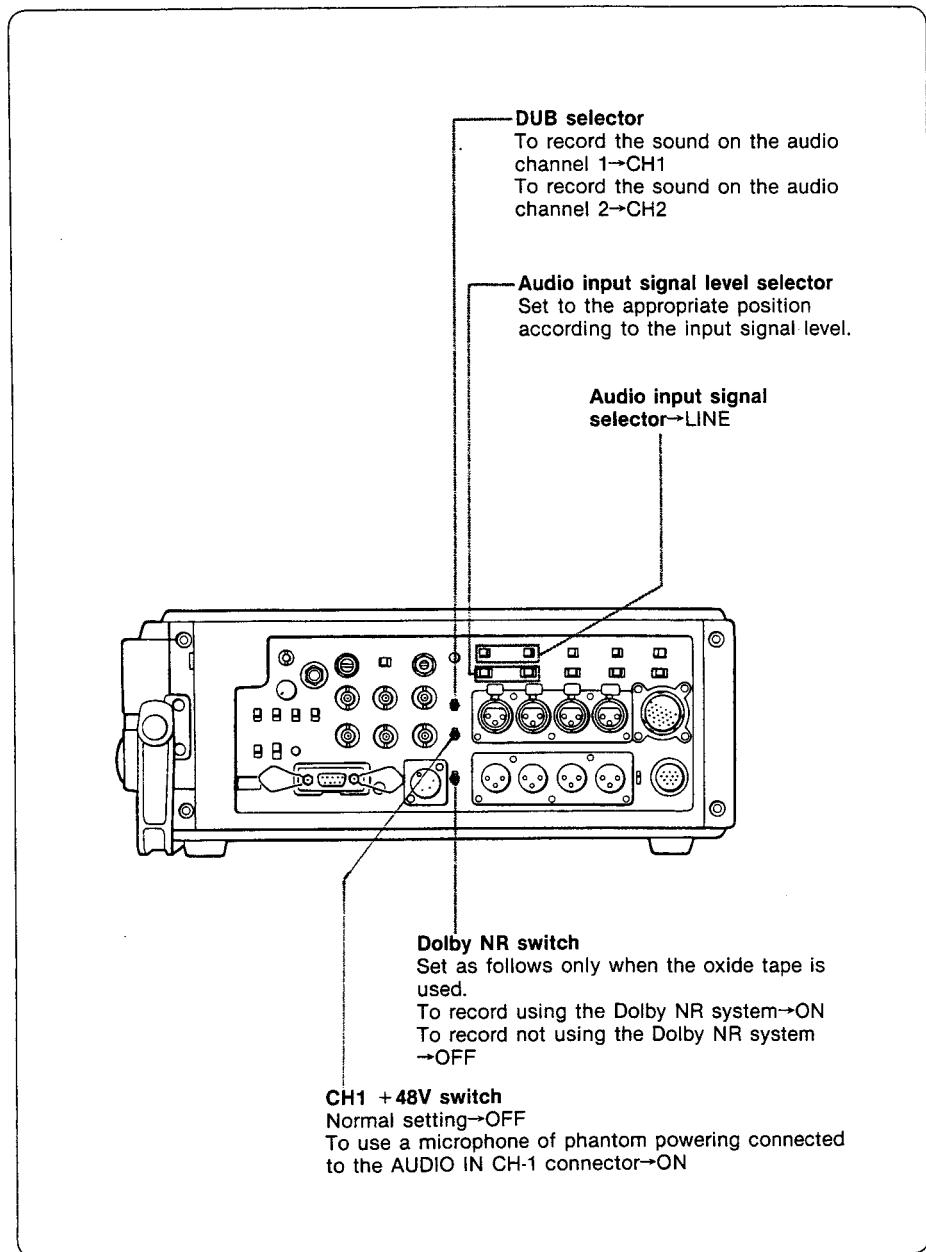
Sound can be added to the audio channel 1 or 2 (the longitudinal track selected by the DUB selector on the connector panel) of the recorded tape. The new recording does not affect on the other recorded audio channel and video signals.

- Sound cannot be added to the audio channels 3 and 4 for AFM recording.

Connections

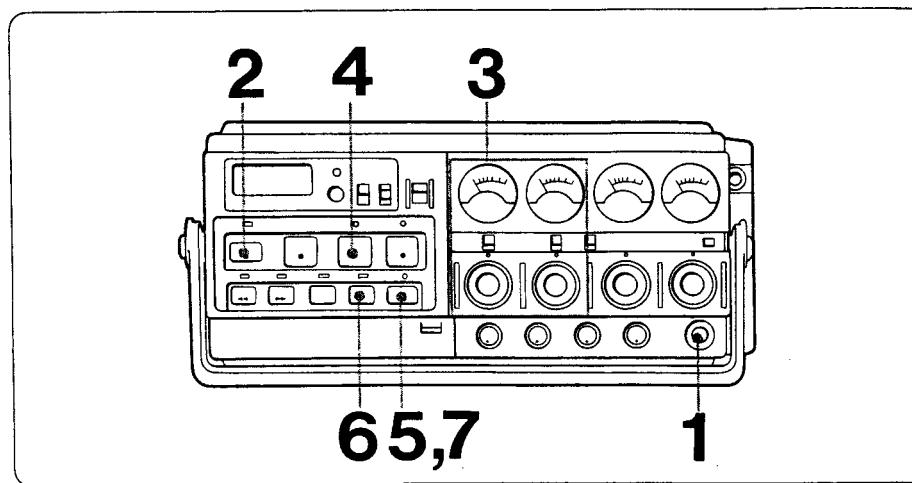


Preparations





Operation



- 1 Set the POWER switch to ON.
- 2 Press the EJECT button, and insert the cassette.
- 3 Adjust the audio recording level. (Refer to "Audio Recording Level Adjustment" on page 31 (E).)
- 4 Press the PLAY button.
Playback begins.
- 5 Press the PAUSE button to stop the tape momentarily at the point to start audio dubbing.
- 6 Press the AUDIO DUB button.
- 7 Press the PAUSE button again.
The pause mode is released, and the audio dubbing begins.
 - Instead of steps 4 through 7, it is also possible to press the PLAY and AUDIO DUB buttons simultaneously for starting audio dubbing. When the PLAY and AUDIO DUB buttons are pressed simultaneously during playing back the tape, the audio dubbing also begins.

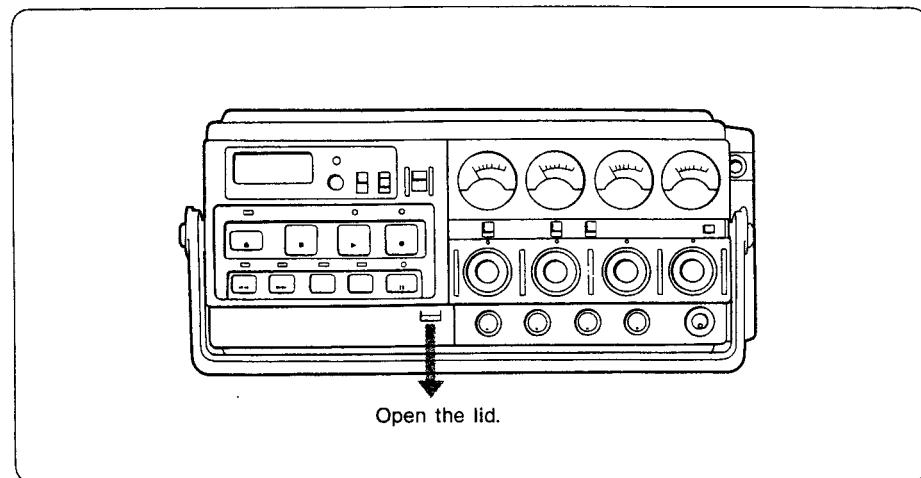
To Finish the Audio Dubbing

Press the STOP button.

TIME CODE

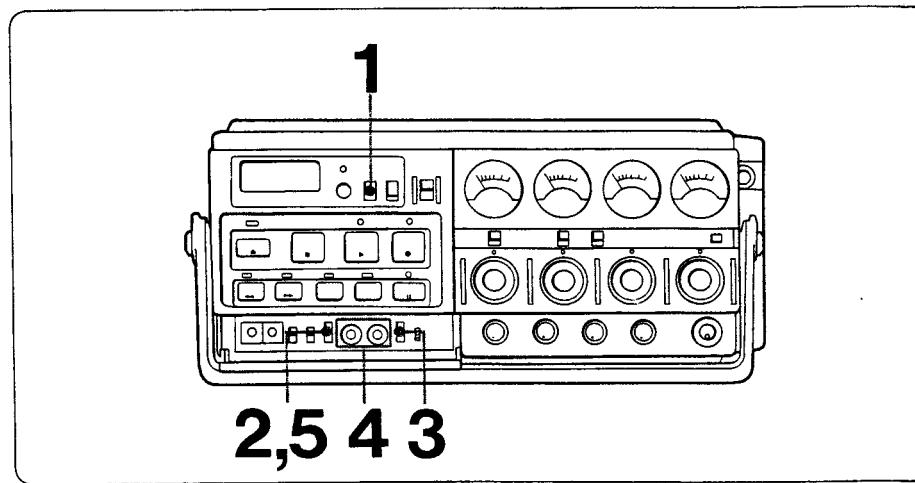
The time code generated by the built-in time code generator is recorded simultaneously when the video and audio signals are recorded. It is possible to record the VITC (Vertical Interval Time Code) together with the LTC (Longitudinal Time Code). When the user bits are set, they are also recorded. As a part of the user bit data, the real time can be set and be recorded.

Open the time code panel lid to set and operate the time code.





Time Code Setting



- 1** Set the DISPLAY selector on the control panel to TC.
- 2** Set the F-RUN/R-RUN selector to SET.
- 3** Set the REAL TIME REC ON/OFF/SET selector to the position other than SET.
- 4** Press the SET ADVANCE and SET SHIFT buttons to set the time code on the display window.
 - The time code data can be set up to 23:59:59:24 (hours:minutes:seconds:frames).
- 5** Set the F-RUN/R-RUN selector to select the operating mode of the time code generator as shown below.
 - To set the generator in free run mode→F-RUN
 - To set the generator in record run mode→R-RUN
 - When the selector is set to F-RUN, the generator immediately starts generating the time code.

User Bits Setting

- 1 Set the DISPLAY selector on the control panel to U-BIT.
- 2 Set the F-RUN/R-RUN selector to SET.
- 3 Set the REAL TIME REC ON/OFF/SET selector to the position other than SET.
- 4 Press the SET ADVANCE and SET SHIFT buttons to set the desired value of user bits on the display window.
- 5 Set the F-RUN/R-RUN selector to the position other than SET.

Data of user bits

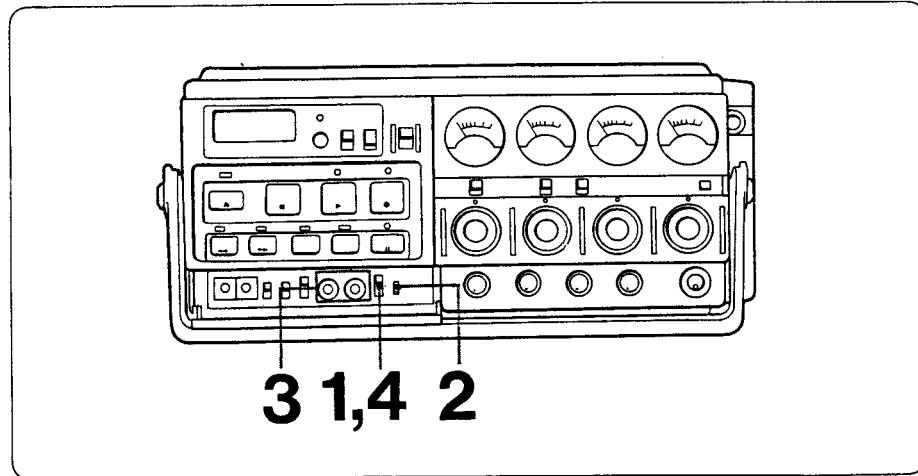
User bits data is composed of hexadecimal figures. Figures A through F is displayed as follows.

	A	B	C	D	E	F
Display	R	b	C	d	E	F

Note

When both time code and user bits are to be set and the time code generator is to be used in the free run mode, be sure to set the user bits first, and then the time code. Otherwise the time code generator stops operation during setting the user bits so that the time code value will be incorrect.

To Set the Real Time into the User Bits



- 1 Set the REAL TIME REC ON/OFF/SET selector to SET.
- 2 Set the REAL TIME LTC U-BIT/VITC U-BIT as follows:
To set the real time into the LTC→LTC U-BIT
To set the real time into the VITC→VITC U-BIT
- 3 Press the SET ADVANCE and SET SHIFT buttons to set the current time on the display window.
- 4 Set the REAL TIME REC ON/OFF/SET selector to OFF.
The built-in clock starts counting the time.



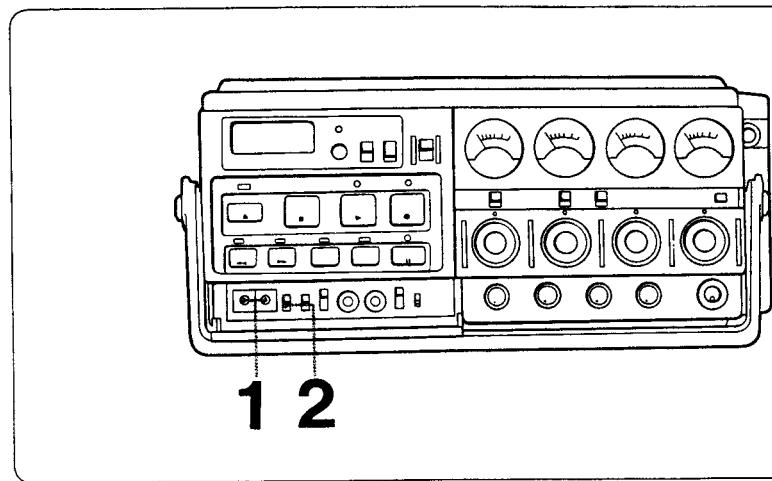
To Check the Real Time

Set the REAL TIME REC ON/OFF/SET selector to REC ON, and the current time of the built-in clock is shown on the display window.

Time Code and User Bits Recording

The LTC and its user bits are automatically recorded together with the video and audio signals when they are set in advance. To record the VITC and its real time also, proceed as follows.

To Record the VITC and its User Bits



- 1 Turn the VITC selectors to select the lines where VITC is to be inserted.
- 2 Set the REC ON/OFF selector to ON.
The VITC and its user bits will be recorded together with the LTC.

To check the VITC value

- 1 Set the DISPLAY selector on the control panel to TC.
- 2 Set the DISPLAY selector on the time code panel to VITC.
The VITC value is shown on the display window.

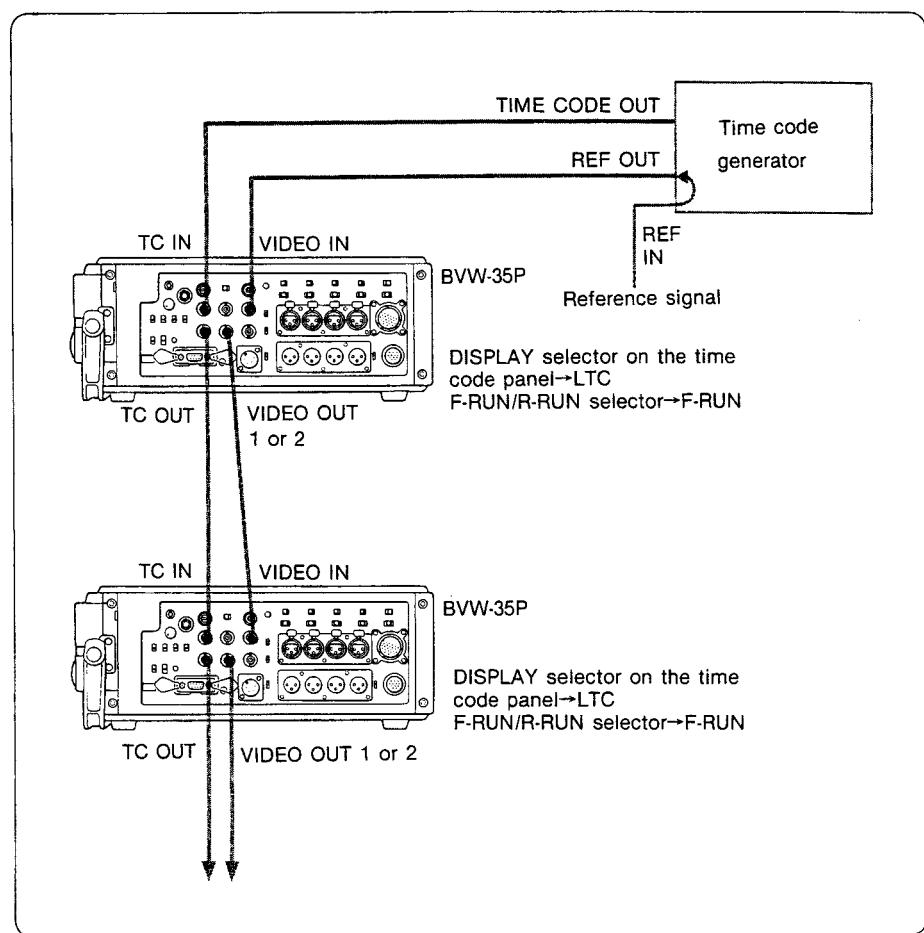
To Record the Real Time

Set the REAL TIME REC ON/OFF/SET selector to REC ON. Then the real time will be recorded as a part of the user bits when the BVW-35P is set in the record mode. When the real time is not to be recorded, set the selector to OFF. At the OFF position, the built-in clock continues counting the time.

Slave Lock of Time Code

The built-in time code generator can be locked with the external time code generator, or in reverse, the time code of another VTR can be locked with the time code generated by the built-in time code generator.

To Lock the Generator of the BVW-35P with an External Generator



When the video and time code signals are connected and the POWER switch is set to ON, the built-in time code generator will be locked with the connected time code. Once the generator is locked, it is possible to disconnect the external time code connection and to set the POWER switch to OFF. In this case, the accuracy of the generated time code corresponds to the sync signal generator built-in the equipment which supplies the input video signal. It is also possible to disconnect the video signal connection with the locked condition kept. In this case, the time code will be generated with the accuracy of the built-in sync signal generator (about ± 3 frames/hours). When the battery is removed to change the new one, the time code generation can continue for about 30 minutes with the backup function.

To lock two or more BVW-35Ps connected in cascade connection, press the REC button. In the E-to-E or record mode, the generators of all BVW-35Ps will be locked with the reference time code. In a mode other than E-to-E or record, the playback time code is output from the TC OUT connector, which is not locked with the reference time code.

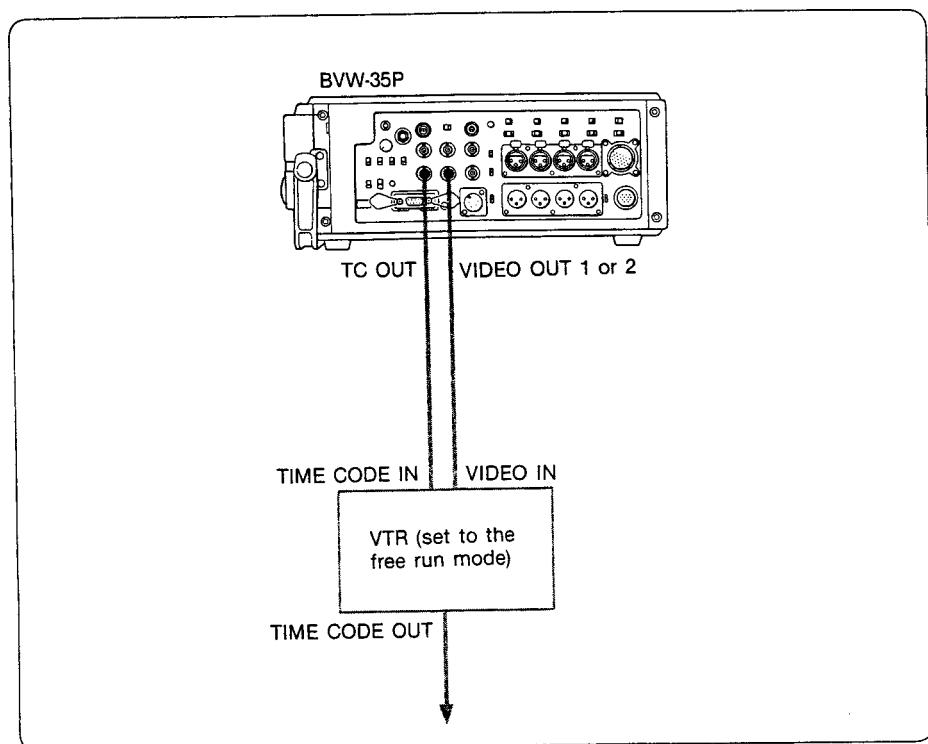
- In a mode other than E-to-E or record, the time code generated by the built-in time code generator can be output from the TIME CODE OUT connector and the generators of two or more BVW-35Ps can be locked with the reference time code by setting the switch on the TC board. For details, please refer to the maintenance manual.



Notes on the slave lock

- When the SAVE/PB.EE/PB selector is set to the position other than SAVE, the generator cannot be locked in STOP mode. Remove the cassette or set the VTR in the E-to-E mode by pressing the REC button, and the slave-lock will be possible.
- The BVW-35P is designed so that the output signal of the built-in time code generator is locked to the video signals based on the field 1 information from the input video signal. In the slave-lock mode, the field 1 information of the input video signal is cut off automatically as the built-in time code generator is locked to the external time code. Once the field 1 information is cut off, this condition continues after the supply of the time code from the external generator stops. To resume the field 1 information, first cut off the time code from the external time code generator, and then set the F-RUN/R-RUN switch to R-RUN.

To Lock Another VTR with the Time Code Generator of the BVW-35P



Slave Lock of User Bits

Besides the time code, user bits can be locked with an external user bits. Set the SLAVE U-BIT selector to ON, and the same user bits as the external one will be generated.



EDITING

The BVW-35P is furnished with the 9-pin remote control connector. Through this connector, connect the "Betacam SP" series VTR such as BVW-75P or BVE series editing control unit such as BVE-900. An editing system can be made using the BVW-35P as a player.

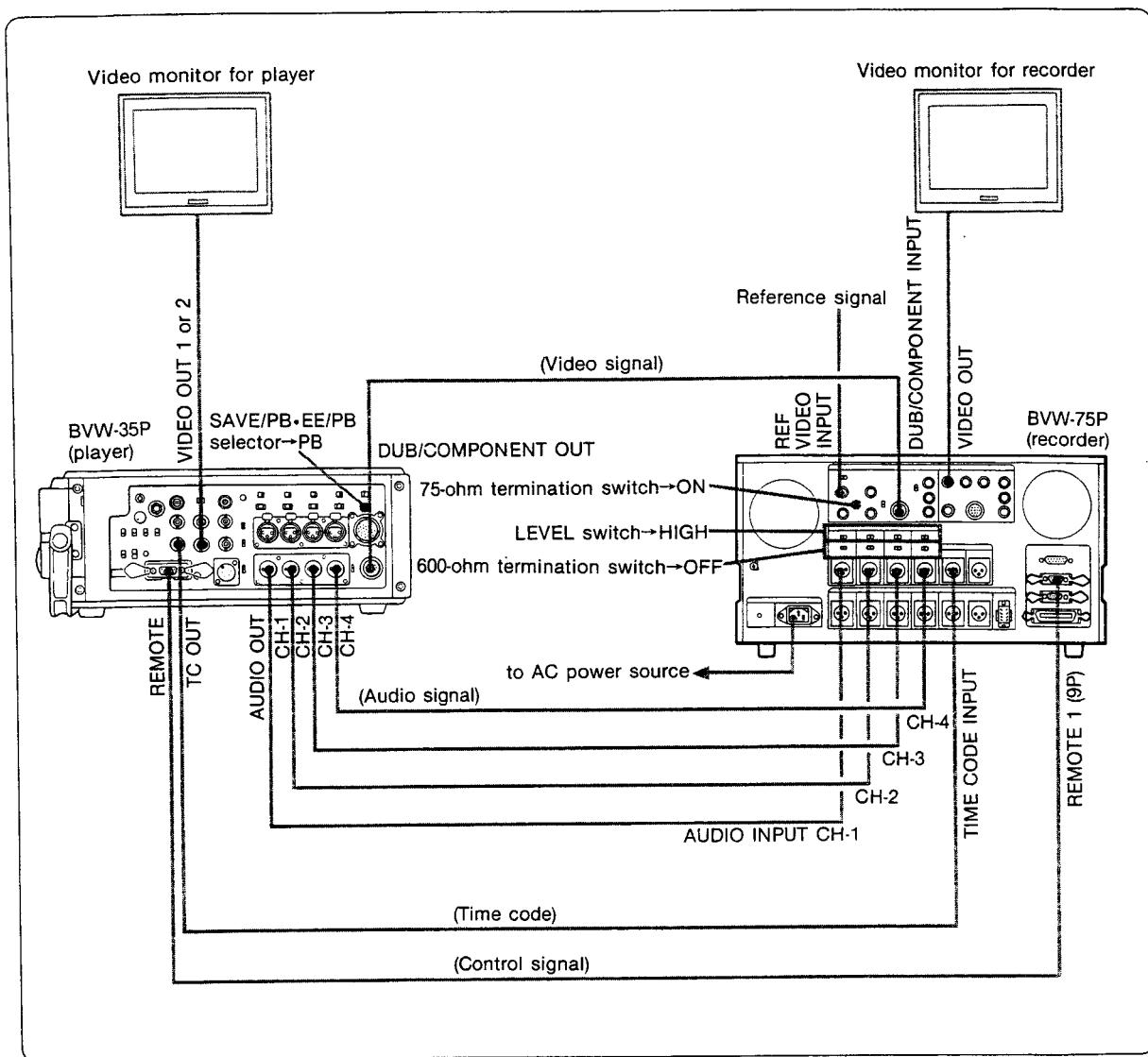
For details on the setting and operation of recorder and editing control unit, refer to the operation manual furnished with the equipment.

Connection of the video signal

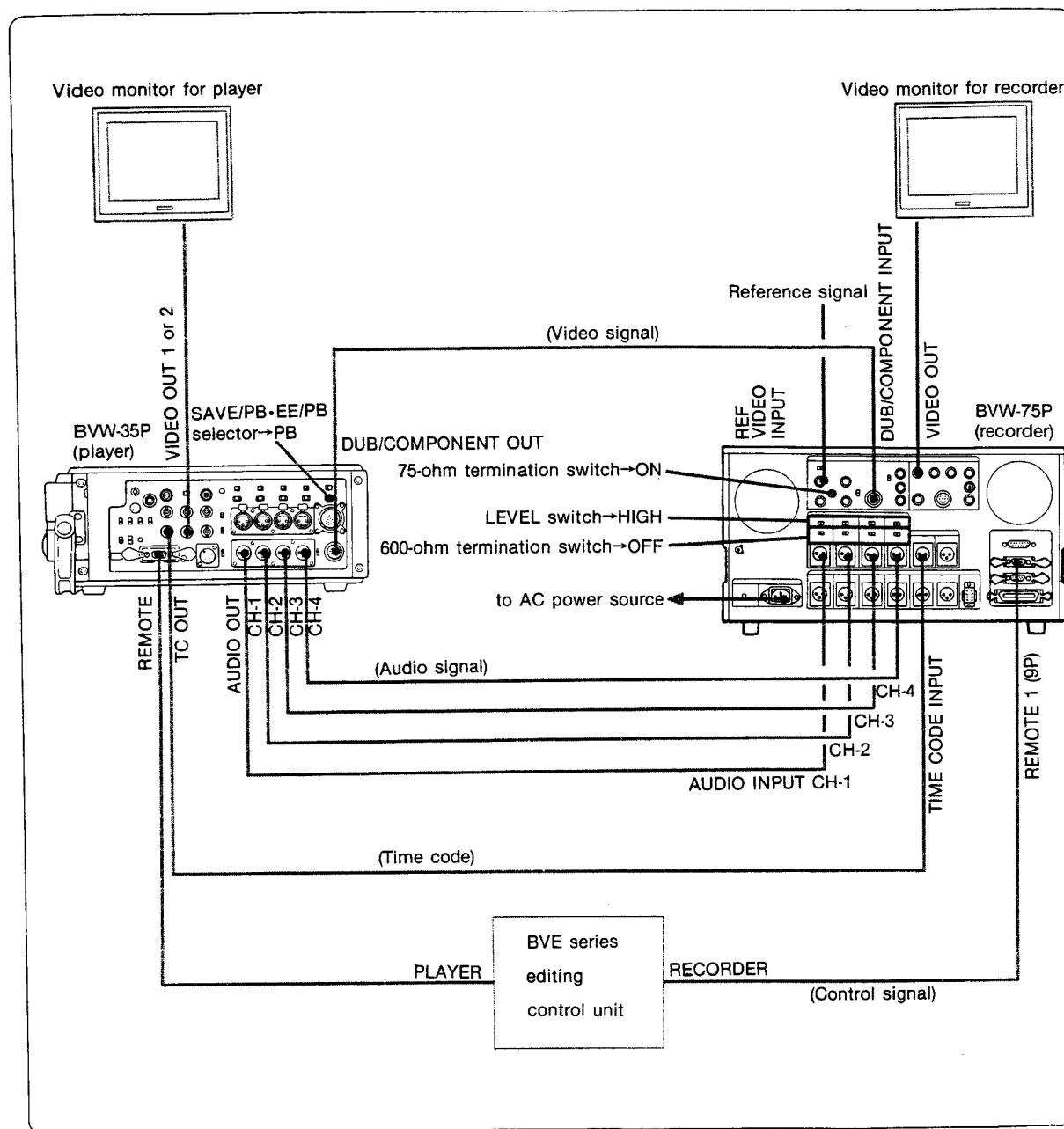
The video signal can be connected using the BNC type VIDEO IN/OUT connectors, but it is recommended to use the DUB/COMPONENT connectors to obtain higher quality picture.

- When the 12-pin dubbing cable is used for connecting the video signal, the reference signal is also connected through the DUB connectors. If the cable with BNC connectors is used, be sure to connect the reference signal from the BVW-75P to the VIDEO IN connector on the BVW-35P.

Editing System 1



Editing System 2 (using an editing control unit)



WARNING SYSTEM

Warning Indications

When the unit cannot work normally, the **WARNING** lamp and warning indications in the display window light or blink to advise the operator of the following operational states. When an earphone or headphones is/are used, the beep sounds through it.

Warning indication		Alarm sound	Tally lamps on the camera		State	VTR operation
Indication	Operation		REC/TALLY	BATT**		
RF				—	Clog of video head or trouble in recording circuit	Recording continues. Correct recording may not be done. →Clean the heads.
SERVO				—	Irregularity in servo	Recording continues. Correct recording may not be done.
HUMID				—	Moisture condensation	Recording If the tape does not stick to the head drum, recording continues. If sticks, recording stops. Other than recording The tape stops. →Press the EJECT button, and remove the cassette.
SLACK				—	Tape slack	Recording stops. Remove the cassette by referring to the maintenance manual.
TAPE END				—	Near tape end	Recording continues.
				—	Tape end	Recording stops. →Change the cassette.
BATT					Near end of battery life	Recording continues.
					Battery discharged	Recording stops. →Change the batteries with the fully charged ones.

Meaning of the marks

Indicators	Alarm sound	Tally lamp on the camera
 : Blinks	~~~~~ ~~~~~ : 1 kHz, 1 second interval	 : Blinks in 1 Hz
 : Lights up	WWWWWWWWWWWWWW : 1 kHz, 1/4 second interval	 : Blinks in 4 Hz
	WWWWWWWWWWWWWWWW : Continuous sound	 : Lights up

* This indication and sound occur only during recording.

- * * The BATT lamp blinks not only when the battery of the VTR is exhausted but also when the battery of the camera is exhausted.



Moisture Condensation

Moisture may condense on the drum assembly if the recorder is moved directly from a cold to a warm location or if the recorder is used in a very humid place. This may result in damage to the tape when it adheres to the head drum. To avoid this, take the following precautions.

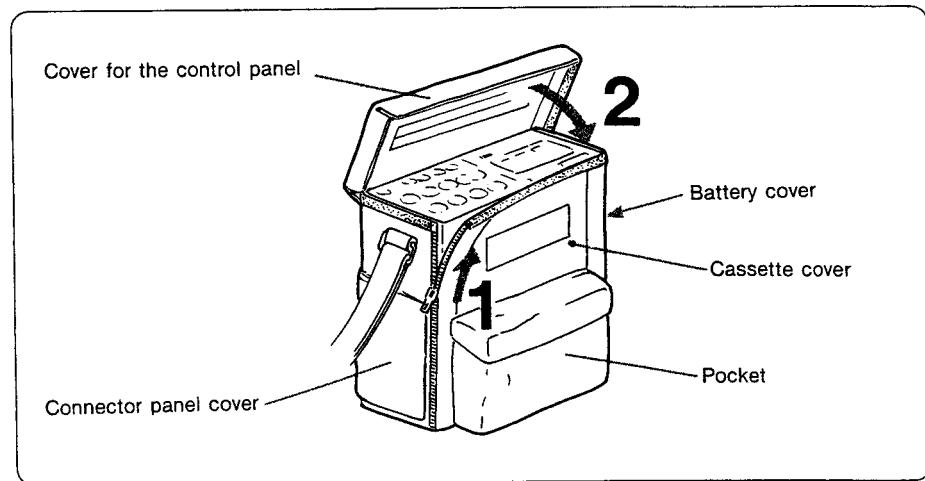
- When the recorder is moved directly from a cold location to a warm location, be sure to remove the cassette.
- Before inserting a cassette, set the POWER switch to ON and check that the HUMID indication does not light. If it lights, do not insert a cassette. Turn off the power and wait until the HUMID indication does not light when the power is turned on.

Head Cleaning

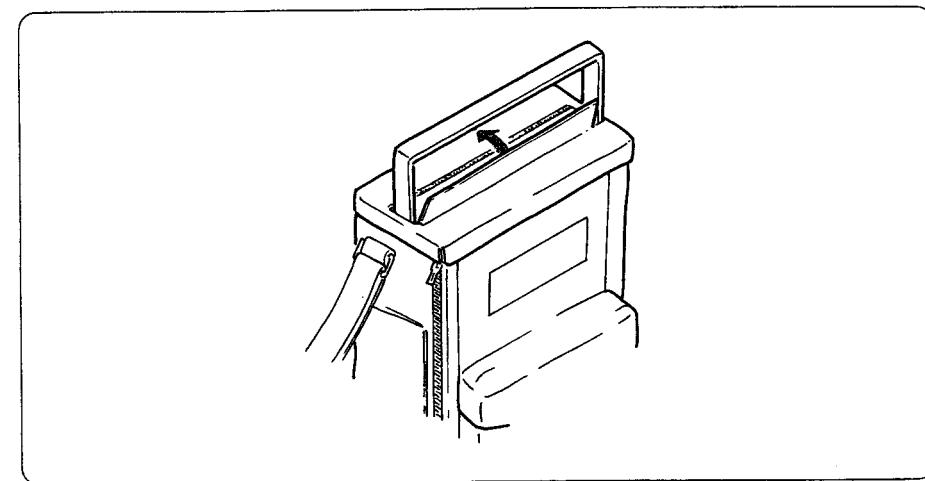
Clean the video head and the audio heads with the BCT-5CLN video head cleaning cassette (optional). For details, refer to the instructions which come with the cleaning cassette.

USE OF THE SUPPLIED CARRYING CASE

To Install the Unit

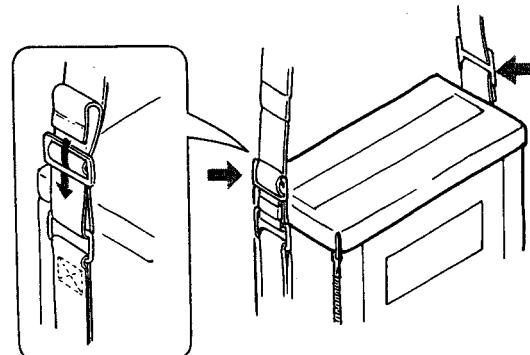


To use the carrying handle



Stand the handle up, and install the unit into the case.

To adjust the length of shoulder strap

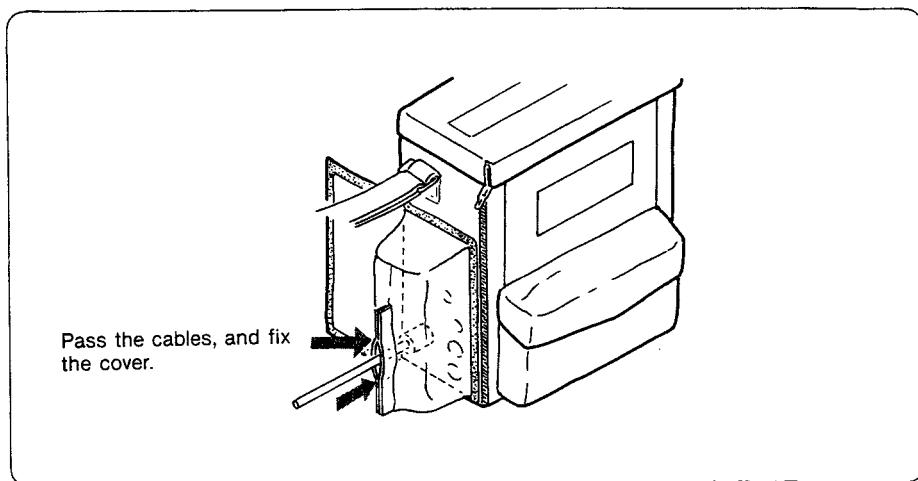


Note

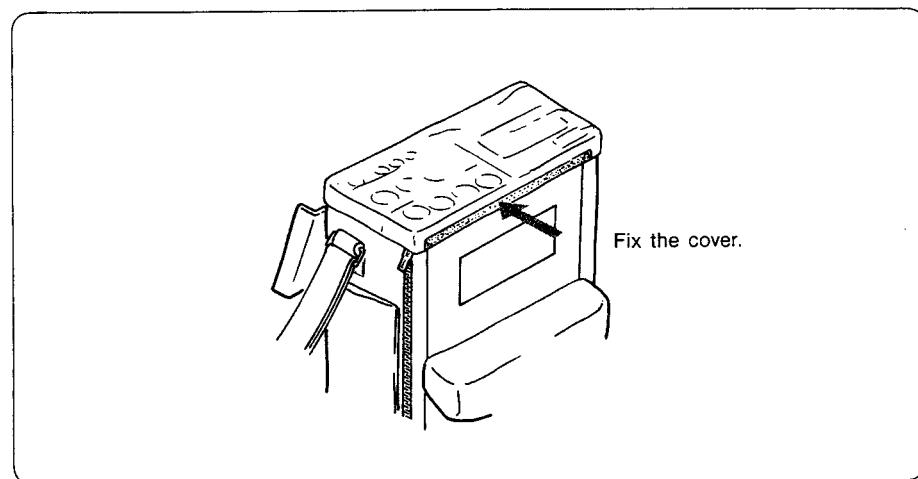
Be sure to connect the shoulder strap as illustrated, or the shoulder strap may slip off.

To Use a Rain Cover

Connector panel



Control panel

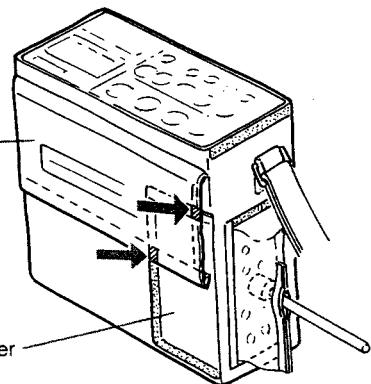


During using the unit

Fix the cover on the rear.

Cover for the control panel

Connector panel cover



SPECIFICATIONS

General

Power requirements	DC 12 V \pm V Using a BP-90 battery pack (nickel cadmium, 3.5 Ah) or two NP-1 (nickel cadmium, 1.5 Ah) or NP-1A (nickel cadmium, 1.7 Ah) battery packs
AC power operation	Using an AC-500CE (Europe)/500 (USA and Canada) AC power adaptor (optional)
Power consumption	Recording mode: 34 W for composite signals 30 W for component signals Playback mode: 30 W Stop mode: 2 W
Operating position	Horizontal or vertical
Operating temperature	0°C to +40°C (+32°F to +104°F)
Storage temperature	-20°C to +60°C (-4°F to +140°F)
Operating humidity	Less than 85% (relative humidity)
Weight	6.7 kg (14 lb 12 oz)
Dimensions	296×140×348 mm (w/h/d) (11 $\frac{3}{4}$ ×5 $\frac{1}{8}$ ×13 $\frac{3}{4}$ inches) including projecting parts and controls
Tape speed	101.5 mm/s
Record and playback time	Maximum 36 minutes (with a BCT-30M video cassette)
Fast forward time	Less than 3.5 minutes (with a BCT-30M video cassette)
Rewind time	Less than 3 minutes (with a BCT-30M video cassette)
Continuous operating time	Approximately 70 minutes with a fully charged battery pack BP-90 when operated with a BVP-5P video camera
Video cassettes	1/2-inch Betacam, Betacam SP cassette Metal tape: BCT-5M, BCT-10M, BCT-20M, BCT-30M and equivalent Oxide tape: BCT-5G, BCT-10G, BCT-20G, BCT-30G and equivalent



Video

Video recording system

Luminance: FM

Chrominance: Compressed time division multiplex FM

	Metal tape	Oxide tape
Bandwidth Luminance (50%)	25 Hz-5.5 MHz ± 0.5 dB	25 Hz-4.0 MHz ± 0.5 dB
Chrominance (50%)	25 Hz-1.5 MHz ± 0.5 dB	25 Hz-1.5 MHz ± 0.5 dB
Signal to noise ratio Luminance	More than 48 dB	More than 46 dB
Color difference	More than 48 dB	More than 45 dB
Y/C delay	Less than 20 nsec	Less than 20 nsec
Low frequency non-linearity	Less than 3%	Less than 4%
K-factor (2T pulse)	Less than 2%	Less than 3%

Audio

Audio recording system

LNG: Bias

AFM: FM

	Metal tape		Oxide tape
	AFM	LNG	LNG
Frequency response (20dB below peak level*)	20 Hz-20 kHz ± 0.5 dB	50 Hz-15 kHz ± 1.5 dB	50 Hz-15 kHz ± 3.0 dB
Signal to noise ratio* *	More than 68 dB	More than 62 dB	More than 58 dB
Distortion (at 1kHz) at peak level*	Less than 3%	Less than 3%	Less than 3%
at 0 VU level	Less than 0.6%	Less than 1.5%	Less than 2%
Crosstalk (at 1kHz)	Less than -65 dB		Less than -55 dB
Wow and flutter (DIN45507)	—		Less than 0.15%
Depth of erasure (at 1 kHz)	—		More than 65 dB

* Peak level—AFM: +19 VU, LNG: +8 VU

** Referred to peak level, weighted CCIR 468-3, with Audio N.R.

Input connectors

VIDEO IN	BNC $\times 1$ Composite: 1.0 Vp-p, 75 ohms
CAMERA	Reference (advanced) sync: 4.0 V p-p, 75 ohms 26-pin multi $\times 1$ Composite: 1.0 V p-p, 75 ohms Component: Luminance 1.0 Vp-p, 75 ohms R-Y, B-Y 0.7 Vp-p (100% color bars), 75 ohms
	Audio: $-60/-20/+4$ dB (selectable), impedance more than 3 k ohms, balanced
SC IN	BNC $\times 1$ 2 Vp-p ± 1.0 Vp-p, 75 ohms, unbalanced
AUDIO IN CH-1, CH-2, CH-3, CH-4	XLR 3-pin female 1 in each $-60/-20/+4$ dB (selectable), impedance more than 3 k ohms, balanced
TC IN	BNC $\times 1$ 0.5-18 Vp-p, impedance more than 10 k ohms, unbalanced

Output connectors

VIDEO OUT 1, 2	BNC 1 in each Composite: 1.0 Vp-p, 75 ohms, sync negative
DUB/COMPONENT OUT	12-pin multi $\times 1$ Luminance: 1.0 Vp-p, 75 ohms, sync negative Chrominance: R-Y, B-Y 0.7 Vp-p (100% color bars), 75 ohms
AUDIO OUT CH-1, CH-2, CH-3, CH-4	XLR 3-pin male 1 in each $+4$ dBm (600-ohm load), balanced
EARPHONE	Stereo minijack $\times 1$ -20 dBs max. (8-ohm load), adjustable
HEADPHONES	Stereo phone jack $\times 1$ -20 dBs max. (8-ohm load), adjustable
TC OUT	BNC $\times 1$ 2.2 Vp-p ± 3 dB (600-ohm load), unbalanced 1.2 Vp-p ± 3 dB (75-ohm load), unbalanced
UHF OUT	IEC-type standard aerial connector $\times 1$ for TV channel 30 to 39 (adjustable), system I/G (selectable)

Remote control connector

REMOTE	9-pin multi $\times 1$
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The input/output level of a component signal conforms to the EBU "N-10" standard.



Special functions

Pause	Possible
Search	Possible (fast forward and rewind of approx. 3 times normal speed)
Editing	Shuttle and jog via 9-pin remote connector Back space editing (STANDBY, SAVE, STOP, EJECT)
Tracking control	Audio dubbing (CH-1 or CH-2, selectable) Possible

Supplied accessories

Extension board.....	
Carrying case.....	
Antenna selector switch	
Coaxial cable with IEC-type standard aerial connector	
Operation manual.....	
Maintenance manual.....	

Design and specifications subject to change without notice.

Recommended equipment

Video camera BVP-3AP, BVP-5P, BVP-30P, BVP-330AP
Camera adaptor CA-3A, CA-30P, CA-300
Battery pack BP-90, NP-1, NP-1A
Battery charger BC-210CE, BC-1WA
AC power adaptor AC-500CE/500

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